JAN 22 1918

JOURNAL
OF THE
AMERICAN PHARMACEUTICAL ASSOCIATION

Vol. VII JANUARY, 1918 No. 1

PUBLISHED MONTHLY BY

AMERICAN PHARMACEUTICAL ASSOCIATION

Office of Publication: Easton, Pa.
Editorial Office: 253 Bourse Building, Philadelphia, Pa.

Annual Subscription, $4.00; Single Numbers, 35 Cents

Entered as Second-class Matter January 23, 1917 at the Post Office at Easton, Pa., under the Act of March 3, 1879.

THE SIXTY-SIXTH ANNUAL CONVENTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN CHICAGO—DATE OF MEETING TO BE NAMED BY THE COUNCIL.

The American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy will also convene in Chicago.

The Fairchild Tablet *of the* Bacillus Bulgaricus

(Lactic Bacillary Tablets)

Contains an abundance of the bacilli of the Fairchild Culture of the true Bacillus Bulgaricus, conserved in a vital state, with a particular "resistance" and length of life.

Boxes of 50 tablets—5 small vials of ten tablets each.

Trade price, $8.00 per dozen boxes; retail price $1.00 a box.

FAIRCHILD BROS. & FOSTER, New York.

"The Sign of the Rx Pharmacy"

THE ABBOTT LABORATORIES

Pharmaceuticals, Chemicals, Serums, Vaccines

PURITY AND ACCURACY

CHICAGO — NEW YORK

Seattle · San Francisco · Los Angeles · Toronto · Bombay

The Red Cross

not only appreciates your membership but desires your coöperation.

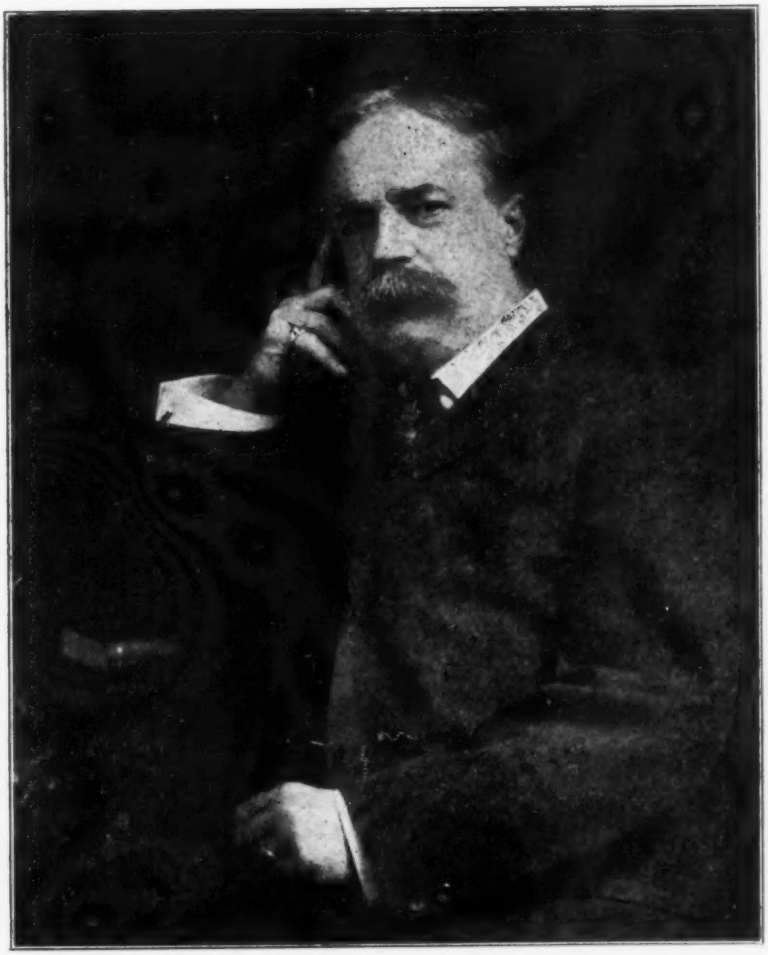
THE DRUG STORE IS THE IDEAL PLACE

for doing a "bit" in reminding the few who have not joined, and the larger number who might, without a reminder, neglect renewal of their membership.

An occasional related Window Display will be of interest

SPECIAL ATTENTION If you want to sell your drug store—or buy one in any state—or want any kind of a position—or need any kind of an employee—or need a Doctor, Dentist, or Veterinarian—write F. V. KNIEST, R.P., Bee Building, Omaha, Neb. Est 1904

Table of Contents of this issue will be found on the last page.



JOSEPH P. REMINGTON

JOSEPH PRICE REMINGTON, Ph.M.

Born Philadelphia March 26, 1847—Deceased January 1, 1918.

Joined the American Pharmaceutical Association in 1867; elected president in 1892; succeeded Dr. Charles Rice (deceased) in 1901 as Chairman of the Revision Committee of the United States Pharmacopoeia, and elected to the same office for the Ninth Revision. Presided at the Seventh International Pharmaceutical Congress in 1893, represented the United States at the Eighth Convention in Brussels, 1896. Presided over the Section on Pharmaceutical Chemistry at the International Congress of Chemistry, 1912. Dean of the Philadelphia College of Pharmacy since 1893; succeeded William Procter, Jr., as Professor of Pharmacy in 1874.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. VII JANUARY, 1918 NO. 1

JOSEPH P. REMINGTON.*

I have been informed that Professor Remington is very low, and that possibly we may never have the opportunity of another visit together. One may be excused, in a case like this, for addressing a mutual friend, even though the subjec be painful to both, and thus I take the privilege of writing you, who, now residint in the city home of Professor Remington, as editor of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, will be in affiliating sympathy with persons like myself, afar off.

These many years ago Professor Remington and I met first in Indianapolis, Ind., at the meeting of the American Pharmaceutical Association, 1879. Professor Remington was then in the vigor of his early manhood. I studied him as a hero, because even at that date his magnificent services to pharmacy had led everyone to consider him as perhaps the most conspicuous incoming American engaged in pure pharmacy in all its outreaches. A professor in the Philadelphia College of Pharmacy; a successful conductor of a drug store in the city of Philadelphia; schooled as he had been with such men as Procter, Parrish and Maisch, with the practical experience that came from personal effort under that Nestor of American pharmacy, Dr. Edw. R. Squibb, in whose laboratory Professor Remington, close to Squibb, served an apprenticeship,—this, too, years after he began his apprenticeship opportunity with the established house of Charles Ellis Sons & Co., of Philadelphia. One can but comprehend that to the present writer the chance, to one whose opportunities had not been great, of meeting this celebrated pharmacist, was an epoch, an event.

May this writer not add that possibly but for Professor Remington he might not himself have been long in the service of pharmacy? Remington it was who championed his cause in a personal way at Indianapolis, even volunteering, and reading, the paper prepared by the writer for that occasion, "On the Conditions Necessary to Successfully Conduct Percolation."

Close together have we been since that date, each serving in the field of pharmaceutical opportunity, these fields often seemingly separated, and yet united as a whole. In my praise of Remington, I voice what seems sure to me to be the sentiment of thousands of pharmacists who, in separated sections of the country, have been in close touch with this leader of us all, Professor Joseph P. Remington, in Philadelphia.

* The editor has received permission to print this letter from Prof. John Uri Lloyd, a life-long friend of the deceased. The references to the latter's life and character have prompted this action. Owing to the nearness of publication day, other matter relating to Professor Remington will be deferred for the February number.

[1] See *Proceedings of the American Pharmaceutical Association*, 1879, p. 682.

My dear Mr. Eberle: May I not, in the frankest way possible, express to you these thoughts, and may I not accept in expressing them, as a lingering member of the associates of Professor Remington who have passed away, as well as thousands of pharmacists in America who may not feel at liberty, as do I, to take that privilege, that I may add to the foregoing even yet, a further word?

Among the past close friends of Professor Remington, none of whom are now with us, I recall Professor Saunders, of Canada, a bosom friend of Remington; they attended, the National meetings and roomed together. Together they visited England, ovations marking their course in that country. So very close were they that the terms Joseph and William only, were used in conversation. That very talented man, Professor John M. Maisch, a teacher-companion of Remington, attended, always in Remington's company, the meetings of the American Pharmaceutical Association; together they came, never a word of discord between them; companions were they, until came the announcement at our Chicago American Pharmaceutical Association meeting (1893) that Professor Maisch had passed away. Dr. Charles Rice, that remarkable man whose biography has never yet been written, and in my opinion, never can be, was to Professor Remington, as to all others, an inspiration. Of Edw. Parrish, to whom Remington was an assistant, Professor Remington always thought and spoke with the utmost veneration, which was also true of Professor Wm. Procter, Jr. And be it said that the wealth of pharmaceutical opportunity that came to Professor Remington from these teachers and companions, was distributed by him to the world-at-large. To thus name all the companions of the olden time, made by Professor Remington, would be to mention every teacher who had accomplished or contributed to the cause during the period of Remington's early activity.

But not alone with such as these did Prof. Remington fraternize. Not a student, within forty years, has been graduated from the College of Pharmacy in Philadelphia, but feels that he is a close friend of sympathetic Professor Remington. It has been my privilege to meet many hundreds of these graduates of that long-established institution, and never, so far as I can recall, did a discussion connected with pharmacy occur but that the name of Professor Remington came in as that of one the speaker knew personally. This, I will say, is literally true, because every member of the classes of the Philadelphia College of Pharmacy for decades has been to Professor Remington a personal charge, and Remington, being in the department of pharmacy, is naturally very close to any student whose life-work is to be pharmacy.

But what of other companions? To my mind's eye they arise, everywhere.

Wherever there was to be an event in pharmacy that would bring together men imbued with the cause of pharmacy, Remington was sure to be present, and not only was he present, but actively so. A leader among them all was he. If an address was to be made, Remington was the one selected for the purpose, in whatever direction it may have been necessary. And, Remington never failed. At alumni meetings and college reunions held by pharmaceutical organizations Remington was considered one of the members, as much so as though his college course had been in their college. Be it known, to Professor Remington the cause of pharmacy was cosmopolitan, and he considered himself to be concerned in every phase of pharmaceutical effort. Whoever was teaching, whoever was studying, whoever was contributing in any direction, and from any direction, was in his circle.

Perhaps the most enjoyable of all occasions at the various meetings of pharmaceutical associations that it came my privilege to attend, were those of the alumni of the Philadelphia College of Pharmacy, and in these always Professor Remington was not only an integral part, but a cherished guest; a representative of the world-at-large, as well as of the College to which he devoted his special time.

And not alone with those concerned in manipulative pharmacy such as becomes the charge of the apothecary, but of men engaged in pharmaceutical activities on a very large scale, such as came into the field with the entrance of the factory

manufacturer, "the manufacturing pharmacist," did Professor Remington affiliate, by right of education. His personal experience with Dr. Squibb, the connection his preceptors, Procter and Parrish, held with such as Tilden and Company, Charles Ellis Sons and Company, Wm. R. Warner and Company, Hance Brothers and White, Charles Bullock, Sharp and Dohme, Frederick Stearns, of Detroit, and others of the struggling pioneers of those days, led Professor Remington to a kindly affiliation with those establishing, and conducting such industries as these. He appreciated that they had become a part in American pharmaceutical evolution, and that in their activities the factor of pharmaceutical education of the individual should dominate. And hence we note his kindly affiliation and helpful services to those who came in later, principal among whom may be mentioned Parke, Davis & Co., of Detroit, and Eli Lilly & Co., of Indianapolis. Well do I remember how, when Mr. Eli Lilly, founder of the house, gave a home banquet on a special occasion two decades or more ago, Professor Remington made the journey from Philadelphia to Indianapolis. And surely Remington would have made that journey if for no other reason than to please his pupil, J. K. Lilly, whose pharmacy instruction was taken under Professor Remington in the Philadelphia College of Pharmacy. Well do I remember that happy occasion, which it was also my privilege to enjoy.

As would be supposed from the congenial nature of Professor Remington, which so impressed everyone he met, his family relationship is most delightful. To touch this phase of his life is a very delicate subject, even in a letter to a mutual friend, but yet I cannot refrain from expressing to you the pleasures that have come to me in the visits to and from Professor Remington's family, and members thereof. To enter that home, is like entering one's own, because of the whole-souled hospitality of each and every member. To this it may be added that Professor Remington's love and affection for his wife and children, as shown to his personal friends, is only paralleled by a reciprocity from themselves. Taken all in all, a very happy and a very charming family is the Remington family I have in mind.

My dear Mr. Eberle: I feel that this letter is much too long, and yet its space would be much too short were one to attempt to present even the high lights of a biography of Professor Joseph P. Remington. I have recorded but a touch of what came to me in the passing along of a discursive letter, as thought crushed upon thought, event upon event, opportunity close following opportunity in the direction of what I felt needs be said, and yet for lack of space could not be said. Painful though it is to think that I am writing this letter during what may possibly be the closing period of the life of this companion and friend, it is yet a melancholy pleasure to feel that I am not passing the bounds of prudence. All I have said and more, will be felt by others who were more fortunate, others who were in daily touch with Professor Remington, as it was not my privilege to be, and who may not, as do I, assume the responsibility of intruding a personal letter.

Strange how insidiously Time moves us in and out. Of those close in the companionship of Professor Remington and myself in days long gone by, very, very few are living.

May I not close this letter with a sentence from "The Code of Manu"—

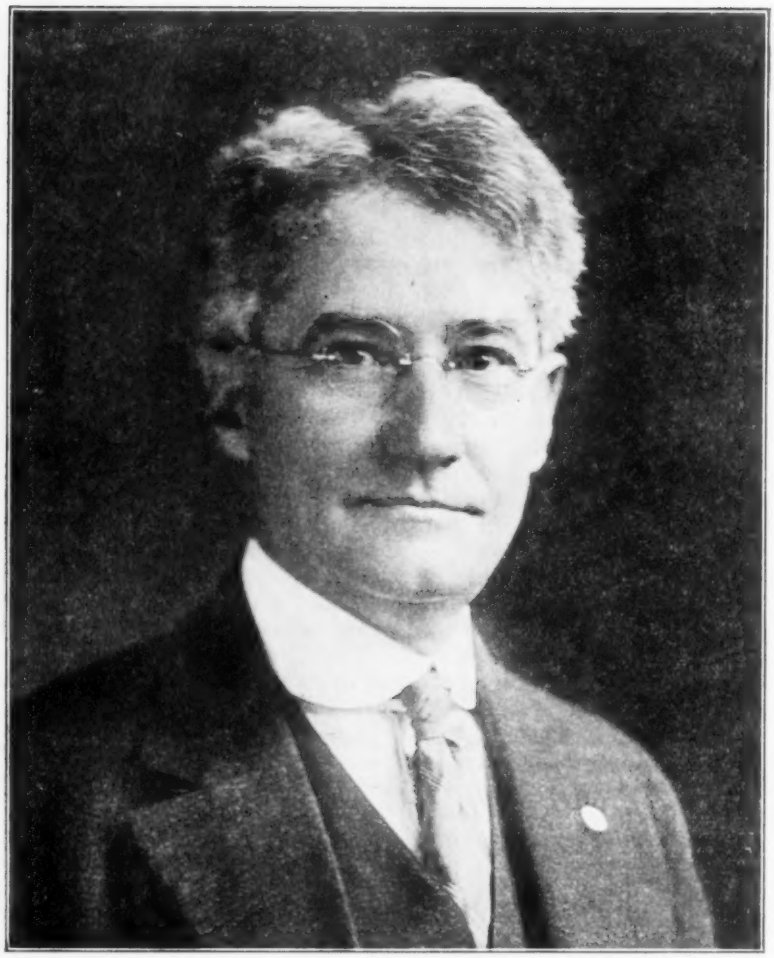
"As drifting logs of wood may haply meet
On ocean's waters surging to and fro,
And having met, drift once again apart,
So, fleeting, is the intercourse of men.

"E'en as a traveller meeting with the shade
Of some o'erhung tree, awhile reposes,
Then leaves its shelter to pursue his way,
So men meet friends, then part with them forever."

Sincerely yours,

JOHN URI LLOYD.

CINCINNATI, O.,
December 29, 1917.



CHARLES H. LAWALL

CHARLES HERBERT LaWALL,

PRESIDENT-ELECT OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

As announced in the December issue of the JOURNAL, Charles H. LaWall has been elected president of the American Pharmaceutical Association.

The President-elect was born in Allentown, Pa., 46 years ago, the son of a druggist of that city, who in 1876 moved to Bloomsburg, Pa., where he had accepted a position with the wholesale and retail drug firm of Moyer Bros., in whose establishment the junior LaWall received his early business training, after having been educated in the public schools and at the State Normal School, located at Bloomsburg. His employment in the drug store was a matter of choice, for he early evidenced an interest in the sciences and sought knowledge by studying growing plants and improvising a small chemical laboratory even before attending college.

In 1891, he matriculated at the Philadelphia College of Pharmacy and graduated here in 1893. The degree of Master in Pharmacy was conferred upon him by the same institution in 1905. He sought employment in Philadelphia which offered the opportunity of a more extended acquaintance with the branches that interested him most, and for thirteen years he was engaged in the laboratories of Smith, Kline & French Company. In 1901, Charles LaWall succeeded Frank G. Ryan as Instructor in the Theory and Practice of Pharmacy in his *Alma Mater*, and in 1905 he was elected Associate Professor in the same department.

In 1903, he became associated with Dr. Henry Leffmann, a prominent chemist of Philadelphia, and when the latter decided to retire Prof. LaWall acquired sole ownership of the business. Since 1904 he has been chemist of the Pennsylvania State Dairy and Food Department, and has also served the Federal Government in a related capacity. In 1909 he succeeded Dr. Leffmann as lecturer in the Course of Applied Organic Chemistry at the Wagner Free Institute of Science. He is a joint author with Dr. Leffmann of a book on Chemistry; he assisted in the last revision of the United States Dispensatory and is a frequent contributor to pharmaceutical and chemical publications. Prof. LaWall is a member of the U. S. Pharmacopoeia Revision Committee of which he is secretary, and also chairman of the Sub-Committee on Inorganic Chemicals.

His papers presented to the various sections of the American Pharmaceutical Association speak in part for his interest in the organization that has honored him with the presidency. He was vice-president in 1915; from 1907–09 he was secretary of the Section on Education and Legislation and in 1910 the chairman; in 1911–12 he was secretary of the Scientific Section.

Mrs. Charles H. LaWall (*nee* Miss Milicent Renshaw) is also a graduate in pharmacy and renders valuable assistance in the many activities of her husband. Both are regular attendants and workers at the annual conventions of the A. Ph. A.; the latter joined the Association in 1896 and the former in 1905. E. G. E.

EDITORIAL

E. G. EBERLE, Editor 253 Bourse Bldg., PHILADELPHIA

THE VALUE OF INDIVIDUAL EFFORT.

"I WOULD not be one of those who would drive a nail into mere lath and plastering. Such a deed would keep me awake nights. Give me a hammer and let me feel for the furring. Drive a nail home and clinch it so faithfully that you can wake up in the night and think of it with satisfaction, a work at which you would not be ashamed to invoke the Muse. * * * * * * * Every nail driven should be as another rivet in the machine of the universe, you carrying on the work."—Henry David Thoreau.

We have often spoken of coöperation; these are times when the loyalty of every individual counts, there should be no neutrals. Just as concerted effort is mandatory in the cause of our country, so is that of every individual pharmacist for pharmacy, so that each one may become a strong support by faithfully doing his part. The great trouble with pharmacy largely is, that too many are standing aloof from doing so, because they seem to feel that what they can do is of little consequence. And still each one has a part in pharmacy and its service to humanity, and has neither right to withdraw nor withhold his support nor belittle his opportunity.

The general, in preparing his plans, cannot ignore the part of the private in the battle; the gunner is dependent on the workman in a far-away munition plant. The medical man must rely on the pharmacist in the pharmaceutical laboratory, if not more directly—on the one who prepares his *armamentarium*. Not one can fail without destroying the efficiency of the other, it is a serious delinquency to disregard the work of any one of them.

What is needed is enthusiasm, which, as Emerson said, "is the leaping lightening, not to be measured by the horse-power of the understanding." Someone else has said, "enthusiasm is the light that leads and the strength that lifts men on and up in the great struggles of scientific pursuits and professional labor." It needs that, we believe, in pharmacy, in the importance of its service, and it is the thought of the individual, that his part is of little consequence, that keeps from pharmacists and pharmacy the recognition they and it are entitled to.

The thing is to do our part well, better than it has ever been done before; there may be "laths and plastering" in the construction of the drug business, but let us "feel for the furring," with the hammer of resolve, drive the nail of our determination into the purpose to progress and clinch it with enthusiasm. Believe firmly that pharmacy has an important part in medicine, and that when it is ignored or neglected, the patient will suffer. The medical man, surgeon or doctor, must look back to the unimportant individual (?), the pharmacist, the person whose part taken by itself may be smaller than his own, yet whose part, if not well done, will prove a serious handicap to his success. And this is applicable to the

pharmacists' service in the Army and Navy. That which the individual can do, and do well, is of real importance, and without doing that, there is deficiency; reversely his coöperation makes for efficiency.

So, then, with the beginning of the year let us drive home, into the thoughts of all pharmacists, the value of individual effort for pharmacy and the Association; each one can do an essential part in contributing to its larger possibilities, by increasing the membership and by participation in the work. One is the minimum, there is no limit to the number of additions each member may be willing to propose and indorse for affiliation in the American Pharmaceutical Association. Every new member adds strength to the organization and makes for its greater possibilities. Be optimistic and enthusiastic, anyone can be pessimistic and indifferent. E. G. E.

THE IMPORTANCE OF DRUG PLANT CULTIVATION IN THE UNITED STATES.

AMONG the many problems confronting the American manufacturer of drug products, that of securing adequate supplies of crude drugs is of increasing importance. Thus far the cultivation of medicinal plants in the United States has not assumed very great proportions, although many drugs are being supplied in sufficient quantities for domestic needs. A great deal of misinformation has been circulated on the topic and many people have been led to believe that cultivation of medicinal plants is just as simple a matter as the growing of vegetables or crops. This is not the case. We must remember that such plants as Belladonna, Digitalis, Hyoscyamus, Aconite, etc., formerly obtained from Europe, grow wild in their native habitat and are picked by cheap labor, thus making the cost to the purveyor very low. The growing of medicinal plants in the United States, which is not the native habitat of the drugs enumerated above, is a science which requires expert training and supervision. We must provide artificially the conditions under which these plants grow best and the cost and labor is many times what is paid the European peasant who collects drug plants.

Two methods of overcoming the high cost of cultivating drug plants are open to the American grower: first, increasing the number of harvests in one season; second, increasing the amount of active constituent. Experiments have demonstrated that as many as four and five harvests of Belladonna can be obtained in one favorable season if the leaves are stripped from the plants when they attain a certain maximum growth. In former years it was customary to cut down the entire plant at harvest time, thus greatly reducing the yield of Belladonna leaf. There is very little difference in the activity of the leaf of the third or fourth harvesting in comparison with that of the first harvesting as far as the amount of active constituent is concerned.

With regard to increasing the amount of active constituent, experiments

show that by careful selection of seed it is possible to increase in some plants the amount of active constituent three or four times that required by the Pharmacopoeia. Experiments in cross-pollenization have not been successful so far as increasing the amount of active constituent goes. In 500 Belladonna plants grown at Glenolden, Pa., last year the amount of active constituent varied from below $^1/_{10}$ of 1 percent to as high as 1.2 percent; the general average was about $^6/_{10}$ percent, or twice the Pharmacopoeial requirement. Seed from the plants which yielded a high percentage of alkaloids, when used for propagating purposes in succeeding years, usually produce high alkaloid-containing plants, although this is not always the case. We are confronted with variations due to numerous causes, which must be carefully studied if the drug-plant industry in the United States is to be placed on a competitive footing with that of Europe after the war.

Physiological and chemical tests on the American-grown plants show that some of the old ideas regarding the activity of plants were erroneous; for instance, it has not been so long since American Cannabis was not thought fit for medicinal use, but it has been clearly demonstrated that it is just as active and satisfactory as the Indian Cannabis and our Pharmacopoeia now recognizes it. For many years it was thought that Digitalis leaves of the first year's growth were not active and that only leaves of the second year's growth gave satisfactory results in medicinal preparations. This idea has been shattered also and the Pharmacopoeia now makes no distinction between the first and the second year leaf and rightly.

The problem of properly drying plants after they have been cultivated is in some cases a difficult one, owing to the frequent changes in climate at harvest time. However, this problem is also being solved so that the natural color is preserved to a large extent in the cultivated plants when they are dried, thus obviating any criticism as regards the color of the finished preparations. While the problem of color in pharmaceuticals is merely a psychological one, it seems to be difficult to dispel the belief, especially among laymen, that color is a criterion of strength or activity.

Were it not for the chemical and physiological methods of assaying and standardizing drugs, the fact that American-grown drug plants are sometimes very high in their yield of active constituents would be a source of danger. Obviously, a tincture of Belladonna made from a drug which assays three times the U. S. P. strength would be a dangerous preparation if used in the ordinary dosage. However, the assay shows what the strength of the drug is and what the strength of the finished product is and we can make our dilutions or concentrations accordingly.

The scarcity of some of our important botanical drugs is apt to lead to adulterations. It is fortunate, therefore, that the Government has an organization (Bureau of Chemistry) for detecting adulterants, etc., under the Food and Drugs

Act, thus protecting the physician, the pharmacist and the patient. Nevertheless, there is always opportunity for the perpetration of fraud and "Safety First" must be our motto when purchasing crude drugs and preparing galenicals.

The American crude drug industry has made remarkable advances since 1914, and with the advances that are being made each year and the scientific investigations conducted in the various research laboratories, there seems to be no doubt as to its future permanency. H. K. M.

PHARMACY AND THE WAR.

PROF. ALEXANDER TSCHIRCH about a year ago delivered a lecture before the German Pharmaceutical Society in which he stated that "the production of a sufficient quantity of food is essentially a botanical problem, as meat is only vegetable food converted by animals into a suitable form." The thought can, in a way, also be applied to the production of vegetable materia medica products.

President C. A. Hill, in his presidential address at the annual meeting of the British Pharmaceutical Conference, July 11, 1917, spoke of the "British Medicine Supply in War Time," in which he referred to the shortage of botanical drug supplies.

A symposium on drug culture constituted part of the program of the Scientific Section at the Indianapolis meeting of the American Pharmaceutical Association. Thus the importance of plant culture is recognized in all countries, and present conditions have intensified the interest of the subject.

Whether the deficient supply of official drugs, the possibility of substituting specially cultivated or other drug-yielding plants for them, warrants the issuance of a supplement to the Pharmacopoeia in which other medicinal agents are to be included, may be a matter worthy of consideration. It is not contended that the necessity exists, but the Government has permitted the use of some non-official drugs, and it might be deemed advisable, in some instances, to give pharmacopoeial sanction also, and at the same time make advantageous changes in certain menstrua, solvents, vehicles, standards and tests; or, it may be more expedient to have these matters taken up in the National Formulary, should the proposition be worthy of serious consideration.

Under *General Principles to be Followed for the Ninth Revision of the Pharmacopoeia* (13, p. XXXIII) is the following: "Supplement.—It is recommended that the Committee of Revision be authorized to prepare a supplement to the Pharmacopoeia at any time they may deem such action desirable." It must be remembered that the conditions now existing are temporary; on the other hand, that the next revision of the Pharmacopoeia will probably not be completed before 1925. Some official drugs, oils, etc., are unobtainable; alcohol, sugar and glycerin are, in a degree, restricted; progress in drug culture may yield drugs

of which the galenical preparations differ physically from those heretofore prepared. There is large demand for preparations for which standards should be provided. This is only suggestive and should be studied carefully from the standpoint of necessity and helpfulness; the prompting is an expression of a desire, not to be delinquent in discovering the needs of pharmacy.

President C. A. Hill, in his address, recommends the promotion of research work by pharmacists in investigation of the extent of deterioration of drugs, chemicals and galenicals under normal conditions of the pharmacy, and also as to how far physical constants are good criterions of galenical preparations manufactured in accord with official directions.

The concluding paragraphs are particularly interesting to us at this time. He recommends the formation of a Public Policy Committee, "on which every side of pharmacy should receive representation proportionate to the merits and magnitude of the interests concerned." Very much like the recommendation of Ex-President Frederick J. Wulling for the organization of the American "body-pharmaceutic." President Hill continues, "the Government to-day will not deal with individuals, but only with associations representing large interests. Such a body could claim to be truly representative of pharmacy, and its views would command attention."

The address concludes: "The third year of the war (July 1917) is drawing to a close, and when we consider how complex a thing is an adequate and complete service of medicine, the difficulties which have had to be met, and how few have been the cases in which supplies have failed; that the standard of quality in the medicine service has never for a moment relaxed—perhaps, after all, pharmacy has not done so badly. To-day, when the depths of chemical knowledge are being plumbed for the purposes of destroying life, there is some satisfaction in the reflection that the resources of medicine and pharmacy are devoted to saving it; not only, indeed, to the curing of the sick and wounded, but to maintaining health of our troops and of the civil population. An adequate medicine service is a national asset; that it has been provided under circumstances of unparalleled difficulties is no small thing."

The same thoughts are thoroughly applicable in this country and our efforts should be continued in persuading the Government to take this view and grant adequate recognition to pharmacy and pharmacists. Without this there is lack of coördination in the medical service whereby injustice is done to business, the military organizations, and civilians. Certainly pharmacy is and has been an aid to many of the departments of the Government and could be made more serviceable if for every department in which pharmacy is concerned, one or more pharmacists would be provided; surely, many difficulties that confront the drug business, as well as the Government, would be avoided. E. G. E.

SCIENTIFIC SECTION

BIOLOGICAL STANDARDIZATION OF THE HEART TONIC PREPARATIONS.*

BY H. C. COLSON, JR.

Up to the present time it has been generally recognized that the standardization of the Heart Tonic Preparations such as digitalis, strophanthus, squill and others of less importance, may best be accomplished by biological rather than by chemical methods of assay. The nature of the active principles in the various drugs with the possible exception of strophanthus, in which the strophanthin can comparatively easily be estimated chemically, is such that they cannot conveniently be isolated and estimated in a pure state. Further, since each of these drugs, as for instance digitalis, contains quite a number of active principles which are not always present in the drug in the same definite proportion to each other, it would be impossible to base the valuation of the drug on the estimation of only one active principle.

The value of the drug, *i. e.*, the estimation of its active principles, which may or may not act synergistically upon each other, can, however, be determined by biological assay.

The real problem which confronts investigators in this branch of science, resolves itself into determining the biological method of assay most suitable for the preparations in question, that is, the method which approaches in its accuracy, rapidity of execution and dependability under general laboratory conditions that of the best chemical analytical procedures.

Biological methods of estimation or standardization are in general inherently subject to certain variables which tend to affect the final results. This is true whether the object is to standardize a disinfectant by the Hygienic Laboratory Coefficient Method, or to assay digitalis preparations by the one-hour frog, 12-hour frog or the cat method.

In all cases, with the exception of the cat method, the factors of time, temperature at which the drug is allowed to act, relative concentration of test solution and rate of absorption (in the case of frog assays), or the type of organism employed (in the case of bacteriological standardizations), enter to modify, individually and collectively, the final result. The biological method which has the fewest number of variables and at the same time takes into account the action upon which its therapeutic usefulness depends, should be the one selected.

In my opinion, the cat method offers the best means for standardizing the heart tonic drugs of the digitalis series. Briefly stated, this method consists in

---

*Read before Scientific Section, A. Ph. A., Indianapolis meeting, 1917.

ascertaining the minimum lethal dose per kilo cat, the drug being slowly injected into the femoral vein until death of the animal with typical digitalis poisoning occurs, and expressing the minimum lethal dose (M. L. D.) as percentage strength of an arbitrary standard, which has been adopted as 100 mgs. of digitalis leaves per kilo body weight.

The reasons for this opinion are based on the experience of this laboratory in the physiological assay of heart tonic preparations by both frog and cat methods.

1. *The One-Hour Frog Method of the U. S. P. IX.*—The one-hour frog method, as recommended by the U. S. P. IX, has, in my opinion, the following variables and constants upon which the final result depends, namely:

(1) Concentration of Test Solution, whereby all or only part of the solution may be absorbed within the time limit of one hour.

(2) Absorption Rate due to nature of Test Solution; for instance, digitalin is absorbed much more slowly than tincture of digitalis, etc.

(3) Seasonal variation of Test Animal.

(4) Degree of accuracy in weighing frogs and administering dose.

The factors in the assay which can be made constant if due care is taken are:

(*a*) Length of Test Period (1 hour).

(*b*) Temperature at which the drug is allowed to act (20° C.).

(*c*) Species of Test Animal (*Rana Pipiens*).

Furthermore, as the final calculation of the strength of a sample is dependent upon a secondary assay of a so-called standard substance, ouabain, which assay is likewise affected by the same experimental conditions as set forth above, it is readily seen that in reality at least eight variable factors are liable to enter into a single standardization by the one-hour frog method.

The Factor of Concentration.—The concentration of the test solution recommended for injection, *i. e.*, that the total average dose does not exceed 0.015 mil for each gramme of body weight of frog, or an average total of 0.5 mil, is not always attainable, and many times where the sample is low in toxicity it is necessary to give over 1 mil, which is equivalent to 0.030 mil per Gm. frog. Other things being equal, it is obvious that the larger the quantity of liquid necessary to represent a certain dose, the longer the time required for total absorption. The volume of the dose may be made smaller by evaporating the samples to give the required concentration, but no matter how careful the process of evaporation may be, it is more than probable that some loss in activity will take place. This applies especially to the digitalis series of preparations.

Rate of Absorption.—Experience has shown that some substances are absorbed more slowly than others; among these are, as already mentioned, solutions of digitalin; further solutions of digitoxin and those containing acetic acid. Other investigators have recorded similar observations.[1] The rate at which the dose is absorbed after injection into the lymph sac frequently depends upon the health of the frog. The so-called red-legged disease is very prevalent among frogs and without doubt such diseased frogs give unreliable results. However, it is equally true that apparently healthy frogs often have a relatively large amount of unabsorbed solution in the lymph sac at the end of the test period of one hour. This applies especially to fluidextract of digitalis, digitalin and acetic squill.

While therefore frogs are entirely unsuitable for assaying digitalin by the one-hour method very concordant and satisfactory results are obtained by the cat method as shown in Table I. Therefore the cat method has proved with me to be a very useful and satisfactory method of assaying hypodermic and tablet triturate preparations of digitalin.

TABLE I.—BIOLOGIC ASSAY OF DIGITALIN.

(Merck's Digitalin.)

(Test Animal—Cat.)

Date of assay.	Sex and wt. (kilos) of T. A.	Value of sol. injected	Lethal Dose for test animal (mils).	L. D. per kilo (mils).	L. D. expressed as Gms. digitalin per kilo.
9/19/16	*2.49	1 mil = .001	14	5.63	.005,63
11/3/16	*2.47	1 mil = .001	14	5.67	.005,67
3/15/17	†2.78	1 mil = .001	16	5.75	.005,75
3/22/17	†3.40	1 mil = .001	19	5.88	.005,88
3/26/17	*3.22	1 mil = .001	19	5.90	.005,90

* = Female. † = Male.

NOTE.—The average M. L. D. expressed in Gm. digitalin per kilo cat is equal to .005,77.

The absorption of preparations of squill containing acetic acid is especially slow and results obtained by the one-hour frog method are generally especially unsatisfactory.

The apparent difference in toxicity of two preparations or substances may possibly be due largely to their different rates of absorption by the frogs. The more rapid the absorption, the greater the apparent toxicity. The one-hour frog method does not properly take care of this source of error, as the test period of one hour is too short and constitutes, in my opinion, the chief objection or criticism of this method of assay. The fact that absorption rates of individual healthy frogs are different and also that some members of the digitalis series are absorbed much more rapidly than others, should be taken into account in a biologic assay. The 12-hour frog method overcomes this objection and in this respect is to be preferred to the method recommended by the U. S. P.

Changes in Reaction of Frogs at Different Seasons.—That a seasonal variation exists in the reaction of frogs to the digitalis series has been generally claimed, but so far as my observations are concerned, there is nothing definite to be concluded on this point. A possible lessening in the vitality of the frogs has been noted during the summer months which may give an unwarranted increase in toxicity of samples. No positive evidence of this has been noted, but undoubtedly one lot of frogs differs from a succeeding lot in its reactions to drugs even at the same season of the year. Even the same lot of frogs may react differently to the same sample of ouabain when tested at different times. For example: 0.000,000,7 Gm. per Gm. frog was the M. S. D. by the one-hour method for a sample of ouabain, and when assayed the following day on the same lot of frogs a M. S. D. of 0.000,000,9 Gm. per Gm. frog was obtained.

TABLE II.—OUABAIN.

Biologic Assays by "One-Hour Frog."

Series No.	Date of assay.	Data on		M. S. D. Gm. per Gm. frog.
		Ouabain.	Frogs.	
1	7/3/17	Stock sol. A made Sept. 7, 1916	Held 1 month in storage tank previous to test	.000,001,1
	7/3/17	Stock sol. B made Aug. 29, 1917, from new sample ouabain	Held 1 month in storage tank previous to test	.000,000,7
2	7/3/17	Stock A	Held 2 days in storage tank previous to test	.000,000,7
	7/3/17	Stock B	Held 2 days in storage tank previous to test	.000,000,6

It is to be noticed that in both series of tests tabulated above, the new sample of ouabain was slightly more toxic than the other. These two series bring out not only the difference in reaction of two lots of frogs to the same sample of ouabain, but also the difference in toxicity between ouabain obtained from different sources of supply.

It will also be seen that both lots of frogs showed a slightly greater toxicity for the Stock B ouabain.

These two samples of ouabain were assayed by the cat method with the following results:

TABLE III.—OUABAIN.

Assayed by Cat Method.

Series No.	Date of assay.	Data on ouabain used.	Sex and wt. of test animal, kilos.	Value of solution injected.	Dose of dil.	Equiv. dose of original.	Gm. ouabain per kilo cat.
1	7/31/17	Stock sol. A made Sept. 7, 1916	†2.19	1 mil = .000,01 Gm.	29	15.22	.000,132,2
			†4.15	1 mil = .000,02 Gm.	30	7.23	.000,144,5
			*2.85	1 mil = .000,01 Gm.	36	12.63	.000,126,3
2	7/31/17	Stock sol. B made Aug. 29, 1917, from new sample of ouabain	*2.99	1 mil = .000,01 Gm.	28	9.37	.000,093,7
			*2.56	1 mil = .000,01 Gm.	20	7.82	.000,078,2
			†3.33	1 mil = .000,01 Gm.	26	7.81	.000,078,1

† = Male. * = Female.

The variation in toxicity of ouabain of different source therefore manifests itself also in the cat tests. For Stock A ouabain, the average M. L. D. is 0.000,129,3 Gm. per kilo and for Stock B it is 0.000,078,2 Gm. per kilo cat, hence the latter sample is decidedly more toxic than the other and in this respect the cat method corroborates the frog assay. The so-called "standard" of the U. S. P. one-hour frog assay method is therefore of doubtful value, a fact which has been verified by Rowe.[2]

TABLE IV.—ASSAYS MADE ON DIFFERENT DATES, SHOWING VARIATIONS IN TOXICITY OF OUABAIN AND DIGITALIS, AND EFFECT UPON PERCENT ACTIVITY AS DETERMINED BY U. S. P. IX.

Sample.	Date examined.	One-Hour Frog Method.				M. L. D. Cat Method.		
		Temp. of medication.	M. S. D. Ouabain.	M. S. D. Sample.	Percent activity of standard.	M. L. D. per kilo.		Percent activity.
						Mils.	Mgs.	
Tr. Digitalis	11/6/'16	20° C.	.000.000,65	.006	130.0	1.56	156.0	64.2
(1)	12/4/'16	20° C.	.000.000,80	.009	106.0	1.56	156.0	64.0
	1/29/'17	20° C.	.000.000,70	.009	90.0	1.495	150.0	66.7
F. E. Digitalis	11/21/'16	20° C.	.000.000,80	.000,75	128.0	0.200	200.0	50.0
	12/4/'16	20° C.	.000.000,80	.000,88	109.6	...	...	...
	1/29/'17	20° C.	.000.000,60	.000,72	103.0	0.205	205.0	48.7
Tr. Digitalis	1/5/'17	20° C.	.000.000,7	.0070	120.0	0.975	97.5	102.5
(2)	1/6/'17	20° C.	.000.000,6	.0065	110.6	0.976	97.6	
	1/9/'17	20° C.	.000.000,7	.0065	129.2	...	...	...
	1/9/'17	20° C.	.000.000,7	.0070	120.2	...	...	...
Tr. Digitalis	4/30/'17	20° C.	.000.000,85	.0125	81.6	1.005	100.5	99.5
(3)	5/11/'17	20° C.	.000.001,1	.0110	120.0	...	...	...
Tr. Digitalis	5/1/'17	20° C.	.000.000,6	.008	90.0	1.284	128.4	77.8
(4)	5/11/'17	20° C.	.000.001,1	.008	165.0	...	...	...
Tr. Digitalis	8/15/'17	20° C.	.000.000,7	.0095	88.5	0.752	75.2	133.0
(5)	8/22/'17	20° C.	.000.001,0	.0090	133.4	0.768	76.8	130.0

NOTES:

(*a*) Three cats were use for each cat assay, and the average taken for above table.

(*b*) One-hour frog method of U. S. P. IX used.

The data in Table IV shows that when tested by the one-hour frog method, the variation in the toxicity of ouabain is proportionally greater than that of digitalis preparations tested at the same time. In other words, it is due to this variableness of the ouabain or so-called standard that the samples show such large differences in activity when tested on different dates. Much more constant results are obtained by M. L. D. cat method. While the data are not complete in all cases, still there is sufficient to bring out this point.

Degree of Accuracy Obtainable in Weighing Frogs and Administering Dose.—The U. S. P. recommends that the frogs for assay be weighed to 0.1 Gm. Whether it is possible to comply with this degree of accuracy is doubtful, owing to the large moisture content of the animals and the difficulty in wiping them completely dry. Frogs removed from the constant temperature bath, weighed, returned to the bath for one hour and then reweighed, invariably show a change in weight, generally a loss of approximately one gramme per frog, as shown by the following tables.

A lot of frogs which had been kept in running cold water for one month was weighed, then placed in a constant temperature bath for one and one-half hours,

three hours and twenty-four hours, and after the lapse of these periods was reweighed. The results are given in Table V, which shows that frogs lose considerable weight during the keeping and that the loss is to some extent in proportion to the length of time the frogs are kept, as is evident from the results in this table. This loss applied both to frogs which had been kept for one month in a storage tank and to frogs which were examined two days after their arrival. The loss in this latter lot of frogs was even greater than with the former (see Table VI). The conclusion is that frogs cannot be first weighed and then held at a special temperature an hour or two before injecting doses based on the initial weight if accuracy is desired; and also that frogs should be weighed to the nearest Gm. rather than 0.1 Gm. as specified by the U. S. P. IX.

TABLE V.—SHOWING VARIATION IN WEIGHTS OF FROGS PREVIOUSLY KEPT IN STORAGE TANK FOR ONE MONTH.

Frog No.	Original weight in Gm.	Weight after 1½ hrs. in 21° C. bath.	Weight after 3 hrs. in 21° C. bath.	Weight after 24 hrs. in 21° C. bath.	Change in weight at end of		
					1½ hrs.	3 hrs.	24 hrs.
1	20.3	21.0	20.6	17.9	+0.7	+0.3	—2.4
2	16.1	15.9	15.9	15.8	—0.2	—0.2	—0.3
3	15.1	15.3	15.4	15.3	+0.2	+0.3	+0.2
4	15.2	14.8	14.8	14.1	—0.4	—0.4	—1.1
5	19.5	19.4	19.8	18.0	—0.1	—0.1	—1.5
6	20.3	21.0	20.7	19.1	+0.7	+0.4	—1.2
7	30.4	29.2	28.2	25.2	—1.2	—2.2	—5.2
8	21.1	20.2	20.3	20.2	—0.9	—0.8	—0.9
9	29.1	29.2	29.1	24.8	+0.1	0.0	—4.3
10	21.1	21.4	21.7	20.0	+0.3	+0.6	—1.1
11	20.8	20.8	20.5	20.0	0.0	—0.3	—0.8
12	18.6	18.4	18.3	17.2	—0.2	—0.3	—1.4
13	25.8	25.1	25.0	24.3	—0.7	—0.8	—1.5
14	34.0	33.3	33.2	33.0	—0.7	—0.8	—1.0
15	27.5	28.6	28.8	28.1	+1.1	+1.3	+0.6
16	26.7	26.2	26.3	25.9	—0.5	—0.4	—0.8
17	18.8	18.9	17.5	17.5	+0.1	—1.3	—1.3
18	17.6	17.5	17.7	16.2	—0.1	+0.1	—1.4
19	21.3	21.7	21.9	20.5	+0.4	+0.6	—0.8
20	22.7	22.8	23.5	21.0	+0.1	+0.8	—1.7
Averages,					—0.07	—0.17	—1.39

Granted that a frog is accurately weighed, which in my opinion would be the nearest Gm. or half Gm., and also that the exact dose is administered, there is still the probability that some of the drug may leak out during the test. This may not take place through the point of injection but the fact that the injected fluid distends the tissues, which are readily permeable to fluids, furnishes the basis of this criticism of the one-hour frog method.

The Factor of Length of the Test Period.—In regard to the time factor, it may be said that this can doubtless be made practically a constant if due care is exercised. A few minutes plus or minus one hour frequently have been shown to be highly important, a minus result, *i. e.*, frog heart still beating or in diastole at the end of one hour, being changed to plus result, *i. e.*, systolic standstill of frog heart,

TABLE VI.—SHOWING VARIATION IN WEIGHTS OF FROGS PREVIOUSLY KEPT IN STORAGE TANK 2 DAYS.

Frog No.	Original weight in Gm.	Weight after 1½ hrs. in 21° C. bath.	Weight after 3 hrs. in 21° C. bath.	Weight after 24 hrs. in 21° C. bath.	Change in weight at end of		
					1½ hrs.	3 hrs.	24 hrs.
1	34.5	33.1	32.8	32.0	—1.4	—1.7	—2.5
2	19.3	18.2	18.6	18.3	—1.1	—0.7	—1.0
3	23.8	23.5	23.5	23.0	—0.3	—0.3	—0.8
4	20.8	19.7	19.7	19.1	—1.1	—1.1	—1.7
5	40.9	40.3	40.0	36.1	—0.6	—0.9	—4.8
6	36.9	36.2	36.2	30.8	—0.7	—0.7	—6.1
7	45.7	44.7	45.1	41.3	—1.0	—0.6	—4.4
8	29.8	29.5	28.4	27.2	—0.3	—1.4	—2.6
9	28.8	28.1	28.1	26.8	—0.7	—0.7	—2.0
10	30.6	30.4	30.5	28.8	—0.2	—0.1	—1.8
11	28.8	26.9	26.9	25.2	—1.9	—1.9	—3.6
12	25.7	24.2	22.9	22.9	—1.5	—2.8	—2.8
13	32.6	32.6	32.5	31.0	0.0	—0.1	—1.6
14	18.7	18.2	18.4	17.7	—0.5	—0.3	—1.0
15	38.6	36.3	34.7	34.9	—2.3	—3.9	—3.7
16	27.7	26.0	25.2	25.5	—1.7	—2.5	—2.2
17	32.2	30.1	29.8	28.7	—2.1	—2.4	—3.5
18	15.2	15.0	14.7	14.6	—0.2	—0.5	—0.6
19	37.8	36.6	36.8	35.3	—1.2	—1.0	—2.5
20	32.7	32.5	32.5	28.3	—0.2	—0.2	—4.4
21	32.3	31.4	32.3	29.5	—0.9	0.0	—2.8
Average,					—0.995	—1.14	—2.69

a few minutes after the hour. It has been noted many times in the one-hour frog assay that a positive at the end of exactly one hour is changed in two minutes thereafter to a negative result. In the case of digitalis the administration of sublethal doses may have a paralytic action on the heart from which the frog may and does recover, hence this also accounts for some of the discrepancies in this method of assay.

The Importance of Temperature at Which Test Is Made.—The temperature at which the frogs are maintained during the experiment has been repeatedly shown to have an important bearing on the result.[1,3]

In most laboratories it is feasible to maintain the 20° C. bath recommended by the U. S. P. and the factor of the temperature at which the medicated frog is kept for one hour cannot be overestimated because dependent upon it in large measure is the rate of absorption and *vice versa*.

The Species of the Test Animal.—That the species of frogs used may affect the assay is generally admitted, but by using only one species of frogs, preferably *Rana Pipiens* as recommended by the U. S. P., this factor may also be rendered a constant.

Before taking into consideration the cat method of biochemic assay, other weak points of the frog assay may be mentioned.

My experience has shown that the average frog assay requires oft-repeated trial assays before the M. S. D. can be found. After reaching the approximate M. S. D. it is necessary to obtain the minimum dose which gives two positives

out of three, or better three out of five. What renders the preliminary assays so uncertain at times in their value for subsequent tests, is the fact that frogs very often show systolic standstill "out of order." For example, a preliminary series of three frogs at doses .006, .009 and .012 mil per Gm. body weight, respectively, gives results, —, +, +. Instead of a M. S. D. between .006 and .009 as indicated by the first series, subsequent trials show the M. S. D. around .012 or even above. In other words, frog with dose .009 and heart in systole was "out of order."

Another example frequently found in practice is a preliminary assay, where doses of .000,000,5, .000,000,7, .000,000,9 and .000,001,1 Gm. ouabain per Gm. body weight of frog give —, —, + and + results, respectively. This trial assay indicates a M. S. D. of between .000,000,7 and .000,000,9, but the completed assay indicates a M. S. D. of .000,000,7, or even less. The result is that the preliminary tests are often entirely misleading, a circumstance which often calls for a greatly increased number of trial assays.

The above considerations lead to the question of relative costs of the two methods. It has been my experience that a frog assay costs on the average $1.15 for animals compared with $0.70 for a cat assay. No difficulty has been experienced in obtaining test animals, either cats or frogs, as has been reported by some writers.

Finally, the following very important fact must be mentioned, namely, that the end point in one-hour frog-heart assay is many times far from satisfactory, and its interpretation one way or the other depends in large measure on the operator.

It has been my observation that the end point for the one-hour frog is frequently very indefinite as the heart does not stop in well-defined systole, in other words, there is a varying degree of paralysis of the heart which is interpreted according to the operators' judgment.

II. *Biologic Standardization—By the Cat Method.*—The cat method employed in this laboratory is a modification of the Hatcher procedure.[4] The suitably diluted sample is slowly injected into the femoral vein until the death of the animal with typical digitalis poisoning occurs. A solution of ouabain is not used, as nothing is gained thereby, either in time or in the accuracy of the test. As to my preference of the cat method over the one-hour method, the following may be pointed out:

The M. L. D. method for the physiologic standardization of the digitalis series using the cat as the test animal has, in the writer's opinion, many advantages for the following reasons:

(1) A shorter time is required for making an average assay, *viz.*, two hours (cat) as compared to three hours (frog).

(2) Cost of animals cost per assay less, $0.70 *vs.* $1.15.

(3) Assay capable of greater absolute as well as relative accuracy, since

(*a*) Cat assays are not affected by seasonal variation in test animal which is clearly shown in Tables I and X.

(*b*) Age or sex of T. A.: immaterial, as shown in the same tables and also in Table VII.

(*c*) Definite end point, *i. e.*, death.

(*d*) Quantity of drug injected is accurately measured.

(*e*) Calculation of activity or strength is not dependent upon a secondary assay (ouabain) which would tend to lower the degree of accuracy by introducing more variables.

(4) According to the U. S. P. the application of the digitalis series in therapeutics is proportional to its toxicity.

Time Necessary to Complete an Assay by Cat Method.—Compared with the one-hour frog, a much shorter time is needed to make an average assay. The assay can be completed in two hours, and usually the first two cats will be sufficient to obtain concordant results, and it is seldom necessary to use three animals.

Relative Cost of Two Methods.—The average cost of the two methods of assay has already been stated and is self-explanatory. This result is not, however, in agreement with the findings of some laboratories, as, for example, the Hygienic Laboratory.[5]

REASONS WHY CAT ASSAY IS MORE ACCURATE AND DEPENDABLE.

(*a*) In regard to the reaction of the cat to the active principles of the digitalis series, it has been my observation that it does not change from season to season, a fact borne out by data in Tables I and X. In this respect it seems to be an entirely satisfactory test animal and is very constant in its susceptibilities to the action of the digitalis series. The cats which have been used for standardization tests in this laboratory have been typical of the common stray cats of any large city which would ordinarily in time be destroyed by the duly authorized city officials. It has been my experience that such cats are seldom diseased.

(*b*) Age and sex of the cat are immaterial according to my experience. Results obtained by using female cats of 1.5 kg. body weight will check those of male cats weighing 3.0 kg.

(*c*) Cats can be weighed much more accurately than frogs and, furthermore, they do not change weight, at least during the period of the assay, as is the case with frogs. Roughly, the average error in weighing cats is ± 0.5 percent and for frogs it amounts to ± 2.0 percent. No leakage of the test solution during injection into the femoral vein of the cat is possible and since the total amount of drug injected is accurately measured by a burette, the calculation of the physiologic strength of the sample can approach in accuracy that of a quantitative chemical analysis.

Applicability of Cat Method to Biologic Standardization of Heart Tonics.—The cat assay method, while inherently subject to a certain limit of accuracy due to the fact that all physiologic standardizations are reactions between active chemical principles and healthy living tissues, has practically no variables to deal with, such as temperature, time or rate of absorption, etc., and hence in my opinion the percentage error is much less than in the assay recommended by the U. S. P. IX. The cat method of assay, as in all applications of biologic reactions to the purposes of quantitative standardization, requires that at least two out of three tests on the same sample shall be concordant. This is necessary because of the fact that individuals of the same species, whether man or the lower animals, show differences in their reaction to drugs which may be both qualitative and quantitative. The differences are generally quantitative and hence in all biologic assays one must obtain a majority number of concordant results in each series of tests. In this way the peculiar or exceptional reactions of a drug upon the test animal, *i. e.*, its idiosyncrasy, can be taken care of.

The argument is often made by those unfamiliar with physiologic testing, that a biologic test on cats, etc., does not furnish a reliable guide to the action or activity of a drug so tested, when it is applied to man. It is probably true that what constitutes a therapeutic or toxic dose of digitalis for a cat would not proportionally be the same for a man, but it is true that in both instances the typical actions of a potent digitalis preparation would be present.

The real purpose of biologic testing is to measure the strength or activity of a preparation, so that it may be adjusted to a uniform or standard strength,

i. e., standardized. The method of assay which accomplishes this object with the greatest degree of accuracy is the logical one to employ. The value of such a standardized product to the practicing physician is obvious.

The U. S. P. states that preparations of digitalis after being assayed by the "One-Hour Frog" (a toxic method) should be corrected so as to conform to the standard adopted. In my experience, the cat method, which also belongs to the toxic type of assay, has been more satisfactory in all respects for purposes of estimating or standardizing. Because in the cat method fewer variables enter to lower the limit of accuracy, the ratio between the toxicity of samples and their therapeutic efficiency must be more constant when determined by this method.

In this connection the following tables giving the results of biologic assays upon a series of digitalis samples will be of interest.

TABLE VII.—A COMPARISON OF BIOCHEMIC ASSAYS ON SAMPLES OF TINCTURE OF DIGITALIS BY THE CAT AND "ONE-HOUR FROG" METHODS.

Sample No.	One-Hour Frog.			M. L. D. for Cat.			
	M. S. D. of ouabain Gm./Gm.	M. S. D. of sample mils/Gm.	Percent strength by U. S. P. IX.	Wt. (kilos) and sex.	Mils per kilo.	Percent strength (100 mgs. lvs = 100%).	Ratio of percentage strengths Cat: Frog.
1	.000,000,8	.007	137.0	3.11*	1.156	89.0	1 : 1.540
				2.57*	1.090 (1.123)		
2	.000,001,0	.020	60.0	3.41†	1.114	89.0	1 : 0.67
				2.91*	1.139 (1.124)		
3	.000,000,9	.011	98.2	2.20*	1.18	84.8	1 : 1.158
				2.88*	1.18 (1.18)		
4	.000,000,8	.009	106.5	3.52†	1.193	84.5	1 : 1.260
				3.40†	1.176 (1.184)		
5	.000,001,2	.010	144.0	3.66†	1.147	82.2	1 : 1.753
				2.17*	1.290 (1.217)		
6	.000,001,0	.010	120.0	2.86†	1.05	93.5	1 : 1.284
				3.21†	1.09 (1.07)		
7	.000,000,8	.0065	147.5	2.88†	0.903	107.1	1 : 1.376
				3.11†	0.965 (0.934)		
8	.000,000,7	.0080	105.	1.70*	0.882	116.4	1 : 0.93
	.000,000,6	.0065	110.8 (107.9)	2.63*	0.837 (0.859)		
9	.000,000,7	.0070	120.	2.77*	0.975	102.5	1 : 0.85
	.000,000,6	.0065	110.6 (119.7)	3.89†	0.976 (0.975)		
	.000,000,7	.0065	129.2	2.94*			
10	.000,000,9	.007	154.3	2.98*	0.885	109.6	1 : 1.495
					0.940 (0.912)		
11	.000,000,9	.006	180.0	3.85†	0.727	137.8	1 : 1.305
				3.17*	0.726 (0.727)		
				4.29†	1.024		
12	.000,000,9	.010	108.0	3.35†	1.372	97.1	1 : 1.112
				2.41*	1.036 (1.03)		

NOTES:

The average ouabain M. S. D. obtained from above table is .000,000,83.

The average ratio of percentage strength equals Cat : Frog = 1 : 1.228.

† = Male. * = Female.

TABLE VIII.—REARRANGEMENT OF TABLE VII IN ORDER OF PERCENTAGE STRENGTHS AS DETERMINED BY EACH ASSAY METHOD.

Sample No.	Percentage strength by frog assay.	Sample No.	Percentage strength by cat assay.
11*	180.0	11*	137.8
10	154.3	8	116.4
7	147.5	10	109.6
5	144.0	7	107.1
1	137.0	9	102.5
6	120.0	12	97.1
9	119.7	6	93.5
12	108.0	1	89.0
8	107.9	2	89.0
4	106.5	3	84.8
3	98.2	4	84.5
2	60.0	5	82.2

*It will be seen from the above table that in only one instance, namely, sample of digitalis No. 11, are the samples arranged in the same order of strength by both methods of assay.

Table VII shows that excellent check results can be obtained on the same sample regardless of the weight and sex of the cat. This fact is also brought out by data in Table I.

TABLE IX.—OUABAIN.
Biologic Assays.

Date.	One-Hour Frog M. S. D.	Date.	One-Hour Frog M. S. D.
9/26/16	.000,000,5	3/27/17	.000,000,8
10/19/16	.000,000,6	3/30/17	.000,001,1
10/24/16	.000,000,6	3/31/17	.000,000,8
11/1/16	.000,000,5	3/17/17	.000,000,7
11/2/16	.000,000,5	3/22/17	.000,000,8
11/6/16	.000,000,65	4/3/17	.000,001,1
11/21/16	.000,000,8	4/7/17	.000,000,8
11/23/16	.000,000,55	4/10/17	.000,000,8
12/1/16	.000,000,8	4/14/17	.000,000,85
12/18/16	.000,000,85	4/23/17	.000,000,6
1/5/17	.000,000,7	4/24/17	.000,000,55
1/6/17	.000,000,6	4/26/17	.000,000,8
1/9/17	.000,000,7	5/4/17	.000,001,1
1/10/17	.000,000,7	5/10/17	.000,001,0
1/15/17	.000,001,2	5/12/17	.000,001,2
1/19/17	.000,000,6	5/17/17	.000,001,2
1/22/17	.000,000,55	5/17/17	.000,001,3
1/23/17	.000,000,7	5/18/17	.000,000,6
1/25/17	.000,000,65	5/21/17	.000,001,0
1/29/17	.000,000,6	5/22/17	.000,001,1
2/12/17	.000,000,8	5/24/17	.000,000,9
2/14/17	.000,000,85	5/25/17	.000,000,9
2/21/17	.000,000,7	5/28/17	.000,000,9
3/13/17	.000,001,1	6/4/17	.000,000,8
3/15/17	.000,001,1	6/7/17	.000,000,9
3/19/17	.000,000,8	6/12/17	.000,000,7
3/19/17	.000,000,7	6/13/17	.000,001,0
3/26/17	.000,001,1	6/21/17	.000,001,0

The preceding table, IX, gives the results of assay of ouabain by the one-hour frog method extending over the last nine months. The average of the 56 assays is .000,000,82 Gm. ouabain per Gm. body weight of frogs as against the .000,000,5 Gm. standard given by the U. S. P.

The lowest M. S. D. (minimum systolic dose) was .000,000,5 and the highest .000,001,3 Gm. ouabain per Gm. body weight of frog, thus showing a variation of 160 percent. The average of all results over the nine-month period using the same stock sample of ouabain, but many different lots of frogs, is .000,000,82 Gm. ouabain per Gm. body weight. This is much larger than the standard used in the "one-hour method" specified by the Pharmacopoeia, but agrees very closely with that obtained by Rowe,[2] namely, .000,000,86 Gm. per Gm.

A maximum variation in toxicity of ouabain of only 30 per cent is obtained when cats are used as the test animal as may be seen from Table X.

TABLE X.—BIOLOGIC ASSAY OF OUABAIN.
Test Animal—Cat.

Date of assay.	Sex and wt. (kilos) of T. A.	Value of sol. injected.	Lethal Dose for Test Animal (mils).	L. D. per kilo (mils).	L. D. expressed as Gm. ouabin per kilo.
11/28/16	†2.96	1 mil = .000,01	34.5	11.66	.000,116,6
11/28/16	†2.52	1 mil = .000,01	33.0	13.10	.000,131,0
12/13/16	*2.45	1 mil = .000,01	35.0	14.29	.000,142,9
12/14/16	*1.80	1 mil = .000,01	21.0	11.66	.000,116,6
12/21/16	†3.10	1 mil = .000,01	40.0	12.90	.000,129,0
4/4/17	†2.67	1 mil = .000,02	19.0	7.12	.000,142,4
4/4/17	*2.34	1 mil = .000,02	15.0	6.72	.000,134,4
4/6/17	†3.23	1 mil = .000,02	18.0	5.57	.000,111,4
8/1/17	†2.19	1 mil = .000,01	29.0	13.22	.000,132,2
8/1/17	†4.15	1 mil = .000,02	30.0	7.23	.000,144,5
8/8/17	*2.85	1 mil = .000,01	36.0	12.63	.000,126,3

† = Male. * = Female.

NOTE: Ouabain solution made up September 7, 1916.

1 mil = .001 Gm. Ouabain.

The above table shows that the minimum lethal dose varies from .000,111,4 Gm. to .000,144,5 Gm. per kilo cat, or, in other words, a variation of 29 percent as compared with 160 percent obtained by assaying ouabain with the frog as the test animal. It may readily be seen from a comparison of Tables IX and X that the cat method eliminates the factors of time, temperature at which drug is administered, age and sex of the animal.

The frog assays, on the other hand, are vitally affected by the factors of time and temperature, which in turn have an important relation to the absorption rate of the test solution.

The conclusion, offered by Edmunds and Hale, that in most cases the toxic action is not on the heart but on the respiratory centers, hence, "methods which employ as a standard the minimum lethal dose obtained from the higher animals are not applicable to the physiological assay of the digitalis series," is not corroborated by my experience. In practically every assay by the cat method which I have made the toxic action is not upon the respiratory centers, but upon the heart. This is shown by the fact that after the heart has stopped with typical digitalis poisoning the respiration continues for a number of minutes.

It is not the purpose of this paper to discuss the twelve-hour frog method at any length, chiefly because the experience of the writer with this method does not permit of any authoritative conclusions regarding it. Logically a larger dose should be required to cause systolic stoppage of the heart of the frog in one hour than is necessary to cause death in twelve hours. Of the heart tonic series, only strophanthus and squill comply with this. In the case of digitalis and convallaria the dose is less by the one-hour than by the twelve-hour method. Of the two frog assay methods, the twelve-hour is the writer's preference, since it takes into account the difference in the rate of absorption, and allows time for the reaction to be completed, and finally the end point (death) is absolutely unmistakable.

According to the experience of this laboratory with the twelve-hour method, more constant results are obtained than with the one-hour frog. This is especially noted in the tests on ouabain where the M. L. D. is always close to .000,000,45 Gm. per Gm. body weight, a fact which has already been verified by other investigators.[2]

Conclusions.—Conclusions relative to the two methods of biologic assay, which have been discussed in this paper, are for emphasis and conciseness tabulated as follows:

SUMMARIZING COMPARISON OF FACTORS IN BIOLOGIC ASSAYS BY THE ONE-HOUR FROG AND CAT METHODS OF ASSAYING THE HEART TONICS.

Variable or Constant affecting the result of assay.		Effect, if any, upon the	
		One-hour frog assay.	M. L. D. cat assay.
Concentration of Variable	(1) The test solution	Has important effect	Not especially important and negligible
	(2) Absorption rate	Has important effect	Not important and negligible
	(3) Seasonal variation	May or may not be important	Not important and negligible
	(4) Accuracy of administering dose	Low degree of accuracy, hence important effect	Accuracy high, therefore negligible factor
	(5) Sex and weight of test animal	Does not affect assay	Does not affect assay
	(6) So-called "standard" ouabain	Ouabain from different sources variable; important effect	No secondary "standard" used
Constants	(1) Length of test period	Effect vital to result	Time factor does not enter
	(2) Temperature at which drug acts	Effect is very important	Temperature factor does not enter
	(3) Species of test animal	Has been shown to be important by other workers	Species is not a factor

The above table summarizes the basis for the author's conclusion arrived at after extensive use of both assay methods, namely, that the cat method is capable of greater absolute as well as relative accuracy in biologic assays of the digitalis

series. It has also been pointed out in this paper that the considerations of relative cost, definiteness of the end point and time necessary for making an assay are all in favor of the M. L. D. cat method.

BIBLIOGRAPHY.

(1) Baker, W. F., JOUR. A. PH. A., Vol. IV., p. 443.
(2) Rowe, C. W., *Ibid.*, Vol. V., p. 1183.
(3) Roth, G. B., *Hyg. Lab. Bull.* 102, 1916.
(4) Hatcher and Brody, JOUR. A. PH. A., Aug. 1910, p. 362.
(5) Hale, W., *Hyg. Lab. Bull.*, 74, 1911, p. 15.

BIOLOGICAL LABORATORIES OF SHARP AND DOHME,
BALTIMORE, MD., August 1917.

THE CHEMICAL INVESTIGATION OF THE RESINS FROM DATURA METELLOIDES.*

BY CHARLES H. ROGERS.

Comparative amounts of alkaloids, glucosides, neutral principles and other medicinally active plant constituents have to a large degree been the bases upon which the value of vegetable drugs or drug preparations have been established. Tschirch and others have pointed out that vegetable drugs are far from simples as indicated by Galen, but rather that they are exceedingly complex. Pharmacological investigation has shown that the action of isolated principles does not always correspond with the action of the drug itself. Therefore, the pharmaceutical chemist and pharmacologist must pay more attention to the complex ingredients of drugs, or, as they are usually called, "extractives." The term "extractives" used in this connection refers to those supposedly inert materials that are soluble in the menstruum used to dissolve the more important constituents of the drug. Before it is possible to determine the part that these extractives play in the production of the total or composite action of drugs it is necessary to have a clearer chemical and pharmacological understanding of them *per se*. Not only is it of importance to understand their chemistry and pharmacology but it is also necessary that their physical constants in respect to temperature, their susceptibility to enzymic action, etc., must be studied.

It has been shown[1] that preparations made from digitalis which has been dried at a uniformly high temperature (70–90° C.) has an absorption value from 25 to 30 percent greater than preparations made from the commercially prepared article. Knowing that the active constituents of this drug are not vitally affected by ordinary temperatures, it is reasonable to conclude that the extractives have in some way been injured by careless manipulation, and, furthermore, that their alteration may have a decided deleterious effect on the rate of absorption of preparations made from the drug. These same conclusions may have a very important bearing on other vegetable drugs. With these fundamental facts in view, the chemical investigation of the resins (extractives) of *Datura metelloides* was undertaken.

* Read before meeting of Northwestern Branch A. Ph. A., December 5, 1917.

[1] E. L. Newcomb, *St. Paul Medical Journal*, August 1914.

Five hundred grammes of the No. 60 powdered leaves from *Datura metelloides*, 1913 crop, grown in the Medicinal Plant Garden of the University of Minnesota, were moistened with fifty percent alcohol and allowed to macerate for twelve hours. After having packed the moistened drug in a cylindrical percolator, menstruum was added until the liquid began to drop from the lower orifice. Percolation was then discontinued and the whole allowed to macerate for twenty-four hours. The drug was then exhausted of alkaloids as shown by Mayer's reagent. The percolate measured 3380 mils. Fifty percent alcohol was used in the extraction in order that the resins obtained for investigation might be those which would be present in an analogous tincture to that of the U. S. P. IX, *Tinctura Stramonii*.

To the acid tincture thus obtained freshly slaked lime was added until the solution was alkaline to litmus, filtered to remove excess of calcium hydroxide and also the precipitated gums, chlorophyll, etc., and acidulated with dilute sulphuric acid. Three hundred mils of this liquid at a time were placed in a still and the alcohol removed. This operation was conducted on a water bath and at a reduced pressure varying from 350 to 600 millimeters' vacuum. The purpose of reducing the temperature during the distillation of the alcohol was primarily in order that another line of investigation on the alkaloids of *Datura metelloides* might be carried on. This reduction of heat, however, would tend to the least alteration of the constants during extraction of the resin from the crude drug.

The deposited resins were collected, purified and dried in an electric oven for two days at a temperature of 50° C. The total resins from 500 Gm. of drug weighed 13.265 Gm., neutral to litmus, specific gravity, 1.1868 and in color, feel and odor resembled powdered aloes. The percent of soluble resins in the various solvents was then determined and is listed below:

Ether.	Alcohol.	Chloroform.	Ligroin.
35%	91%	82.5%	about 1%
Water.	**Methyl Alcohol.**		**Acetone.**
5.32%	86.14%		52.64%

The method employed by A. Tschirch for the proximate analysis of resinous substances was used to classify these particular resins. From previous analyses it has been found that resins are composed of a mixture of compounds and may be classified only by the particular kind of resin which predominates. Tschirch classifies them as ester-resins, acid-resins, resin-alcohols and resenes. The method employed dissolved the resin in ether, but due to only 35 percent of the resins under investigation being soluble in ether, they were dissolved in chloroform. This chloroformic solution was agitated successively with (1) a 1 percent solution of ammonium carbonate, (2) a 1 percent solution of monohydrated sodium carbonate, and (3) solutions of potassium hydroxide of one-tenth and one percent strength, respectively. These reagents dissolved the acid-resins, which were then precipitated from the alkaline liquids with dilute hydrochloric acid. Analysis showed the chloroform-soluble resins to be 33.33 percent acid-resins. These acid-resins or resinolic acids are composed of the characteristic free acids of the original resin and are usually substances of very complex constitution and possess a high molecular weight.

The residue contained the resin-esters, alcohol-resins and resenes. These were separated by saponification with alcoholic potash when the acid radicles of the esters formed soluble potassium salts. It was determined that 54.54 percent of the sample was composed of resin-esters. These esters, as a rule, yield aromatic acids upon saponification and hence are sometimes classed as aromatic balsams.

The resenes and alcohol-resins were then extracted by agitation with ether. This mixture was then boiled for two hours with acetyl chloride under a properly fitted-up reflux condenser, during which process the alcohol-resins were acetylated while the resenes were not affected. The latter were carefully weighed and found to constitute 9.66 percent of the total resin. The results, showing the composition of the chloroform-soluble portion of the original resin, are given below:

Acid-resins	33.33%
Ester-resins	54.54%
Resenes	9.66%
Alcohol-resins	1.84%
	99.37%

Tschirch distinguished two kinds of resin-alcohols., *viz.*, resinols and resinotannols. The members of the first group are colorless compounds giving no tannin reaction with iron salts, while those of the second group are colored and give a tannin reaction. The resin-alcohols investigated were light amber in color and gave no tannin reaction with a solution of ferric chloride.

Previous investigations have shown resenes to be oxygenated compounds, not acted upon by alkalies and possessing no characteristic chemical properties. They do not appear to be alcohols, esters, acids, ketones or aldehydes.

Combustions were made on two individual samples of the resins with the following results:

Sample.	Carbon.	Hydrogen.	Oxygen.
No. 1	69.4%	9.35%	21.25%
No. 2	68.5%	9.49%	22.01%
Average	68.95%	9.42%	21.63%

Empirical formula: $C_6H_{10}O$.

The analytical characters of the resin from the leaves of *Datura metelloides* are recorded below, also those for its alcohol-soluble, alcohol-insoluble and ether-insoluble portions:

CONSTANTS FOR DATURA METELLOIDES RESIN.

Resin	Saponification number.	Iodine value.	Acid number.	Ester number.	Ash.	Melting point.
Original resin	221.3	85.15	61.8	159.5	0.48	90° C.
Alcohol-soluble resin	168.4	99.86	47.04	121.36	0.23	110.5° C.
Alcohol-insoluble resin	286.2	99.53	39.5	246.7	0.65	above 217° C.
Ether-insoluble resin	315.9	97.88	141.06	174.84	0.14	149° C.

The saponification number (number of milligrammes of potassium hydroxide absorbed by one gramme of resin) was determined by boiling a definite weight of the resin with $\frac{N}{2}$ alcoholic potassium hydroxide V. S. for two hours under a reflux and titrating the excess of alkali with $\frac{N}{10}$ hydrochloric acid V. S.

The iodine value (number of grammes of iodine absorbed by 100 Gm. of resin) was estimated by the Hanus method. This method depends upon the fact that

unsaturated fatty acids, as well as their esters, absorb halogens to form mainly addition products. This constant, then, may indicate to what group of unsaturated acids the resin-acids belong. Compared with iodine values of other resins, it checks with that of Elemi resin[2] of the Bursera species, they being 85.15 and 85.1, respectively.

The acid number (expressed in terms of milligrammes of potassium hydroxide required to neutralize one gramme of resin) was obtained by boiling a definite weight of resin for five minutes under a reflux with 90 percent alcohol and titrating the liquid when cold with $\frac{N}{10}$ alcoholic potash V. S., phenolphthalein used as indicator. This constant expresses the amount of free acids present.

The ester number was obtained by subtracting the acid number for the resin from the saponification number and expresses the number of milligrammes of potassium hydroxide that would be required to combine with only the esters present in the resin.

The foregoing methods with their results afford indications of the nature of resinous substances in question, but their use in the positive identification of the various individual commercial resins is a matter of considerable difficulty even when only one resin is present, and in case of an admixture is often impossible. These constants vary and may even be entirely destroyed by aging, heating, etc. J. Lewkowitsch[3] has shown that the constants for various resins are absolutely destroyed by heating to 300° C. The saponification numbers, iodine values and acid numbers for the resins under examination checked after being heated to a temperature not exceeding 110° C. for two days. However, the constants for resins, including those obtained from *Datura metelloides*, may be recorded, but it is evident that any definite conclusions as to the value or purity of the resins should be drawn with the greatest care.

College of Pharmacy,
University of Minnesota.

A WOOL FAT (LANOLIN) SUBSTITUTE AND THE PREPARATION OF CETYLIC ALCOHOL.*

BY SOL. AXELRAD.

The question of substitutes for various materials has been one of prime importance during these war times, especially those substances and chemicals used in medicine and pharmacy. A year and a half ago the supply of wool fat was very limited and the price asked was four times more than that under normal conditions. A substitute called "Eucerin" imported from Germany was also scarce and the agency for this product had only four ounces left. It was claimed that "Eucerin" was made from the washings obtained in the manufacture of wool fat. The uses of lanolin are many, especially in pharmacy; as a vehicle for ointments, in the

[2] Schmidt and Urban, *J. Soc. Chem. Ind.*, 8, 308, 1889.

[3] *Analyst*, 26, 38, 1901.

* Contributed by the author to the Journal A. Ph. A., October 18, 1917.

preparation of bougies, suppositories, cold creams and plasters of various kinds, etc.

This investigation on a wool fat substitute was undertaken with the idea of making a fatty composition, which would have all of the desirable properties of lanolin, such as body, tenacity, power of absorbing water readily, taking up solutions of various chemicals used in pharmacy, dry powders, etc., etc.

Liebreich claimed that the absorbing power of wool fat was due to the cholesterin ethers it contained. Lifschuetz[1] isolated the cholesterin ethers of Liebreich and proved that they had very little power of absorbing water. He concluded from his experiments that the absorbing power of wool fat was due to the fatty alcohols of iso- and oxycholesterols. He separated from the alkaline washings of partially saponified wool fat two saturated alcohols and one unsaturated alcohol. His experiments further proved that the more purified lanolin was, the lower was its power to absorb water, owing to the fact that during its purification the iso- and oxycholesterols were partly removed.

Unna,[2] in his paper, "Ointment Bases," states that "Eucerin" is a mixture of alcohols of the iso- and oxycholesterin group with petrolatum. He does not, however, give a commercial method for the preparation of these alcohols. The absorbing power of "Eucerin" is due to these alcohols, but Roemer (see below) claims that with the employment of cholesterols for ointment bases, hydrocarbons, such as mineral oil, benzol, etc., are essential, for it is due to them in combination that the absorbing property is imparted. Roemer,[3] in his paper on "The Pharmacy of the Oxycholesterine Ointment Bases," confirms to a certain extent the work of Unna, but he also fails to give a method for the preparation of the alcohols.

Unna[4] states that "Eucerin" has been used in skin preparations in Germany, especially in pure form for ichthyosis. According to the U. S. Dispensatory, 19th Edition, page 97, experiments have been carried on in reference to the absorption of wool fat by the skin. Patschkowski and Kaspar claim that the skin readily absorbs lanolin, but Ritter and Pfeiffer in a long series of experiments were unable to verify these results. Grimm[5] recommends in his paper "*Ueber die Verwendung von Aethal in der Hautpflege*," cetyl alcohol for skin preparations on account of its absorption by the skin and he further states that he has found it useful in the treatment of prurigo, weeping eczema and other skin infections.

In view of the fact that Unna and Roemer have written about the cholesterols, which are aliphatic higher alcohols, and Grimm has given a favorable report on the use of cetyl alcohol, the writer came to the conclusion that the use of this alcohol was advantageous in a substitute for wool fat.

A review of the literature failed to show any commercial method for the preparation of cetyl alcohol. There are many references as to its preparation from spermaceti by saponification with caustic potash and shaking the aqueous soap solution with petroleum ether, this being analogous to the extraction of unsaponifiable matter. Spermaceti is essentially the cetylic ester of palmitic acid. Chevreul, in 1818, isolated the alcohol by the above method. Krafft[6] prepared this substance by the reduction of palmitic acid to the aldehyde and heating it with barium formate. He also made the alcohol[7,8] by heating the palmitic aldehyde with zinc dust and acetic acid and hydrolyzing the acetate formed.

Levene[9] made this alcohol by the reduction of ethyl palmitate with sodium and absolute alcohol. Schorlemmer[10] distilled a dry mixture of barium oxide with sebacic acid. A method given in several text-books for the preparation of cetyl alcohol was the saponification of spermaceti with an alcoholic potash, evaporating the alcohol, taking up the residue with water, adding calcium chloride solution to form calcium soap and extracting with suitable solvents. The above methods are useful for preparing small quantities of cetyl alcohol, but for commercial quantities these methods fall down for obvious reasons.

The method of Schorlemmer was found impracticable on account of sebacic acid not being a commercial substance. The extraction process causes a considerable loss of the solvent employed and formation of troublesome emulsions.

It has been found that cetyl alcohol distils at about 340–350° C. without decomposition and the writer's method is based upon the distillation of the calcium soap of spermaceti. Various experiments were performed with the following purposes in view: 1. Greatest yield of cetyl alcohol. 2. Cheapest process. 3. Most practical method.

Experiment I.—Spermaceti (20 Gm.) was saponified with alcoholic potash, the alcohol evaporated and the residue heated in a distilling flask to 340° C.

Experiment II.—Spermaceti (20 Gm.) was saponified with alcoholic potash, the alcohol evaporated and the soap dissolved in water. To the soap solution was added excess of a 10 percent calcium chloride solution. The calcium soap was separated and dried at 100° C. and finally distilled at 340° C.

Experiment III.—The method employed was the same as in Experiment II, except that the soap solution was saturated with sodium chloride. The soap was filtered, dried at 100° and distilled. Many minor experiments were performed by Method III, but they did not show results of such value as to warrant their description.

Experiment IV.—Twenty grammes of calcium oxide containing about 5 percent water were added to 15 grammes of melted spermaceti. The mixture was heated for about six hours, with occasional stirring. When cooled, the mass assumed a brown-yellow color. On distilling same, frothing occurred at 100° C., due to the escape of water. When the water had all been driven off the temperature was raised to 340° when the cetyl alcohol distilled as white fumes and on cooling formed oily drops, which became pure white upon solidification, the melting point being 49.5° C. The yield obtained was over six grammes, this being over 40 percent of the actual spermaceti taken. The theoretical yield (calculated) was about 45 percent.

This method gave a larger yield than the other three preceding methods, and, calculating the cost of the alcohol obtained on a 40 percent basis, was also cheaper in this method. The ideal temperature for the distillation of cetyl alcohol is 330°–350°, as above this temperature a yellow liquid distils, being strongly acid and having a pungent odor; its value commercially will be investigated at a later date.

A copper still, manufactured by Sargent & Co., Chicago, for the distillation of oils, etc., at high temperatures, was found to be of most service. Glass stills are apt to crack, due to the "caking" of the residue which can readily be removed from the copper still, after each distillation.

Mixtures were made having different quantities of base, cetyl alcohol, lanolin and water. The formula finally selected as being the best suitable for pharmaceutical compounding was the following: 70 parts petrolatum, 20 parts paraffin (m. p. about 60° C.), 10 parts cetyl alcohol, 5 parts lanolin (anhydrous), 100 parts water. This preparation stood in the laboratory for 17 months with absolutely no change in appearance or working qualities. The properties of this mixture are the same as wool fat, that is, taking up solutions of salts, powders, etc., etc. The advantage over wool fat is that it will not become rancid and is considerably cheaper. The reason for using 5 parts of lanolin in the mixture was to have the "unctuous" property of wool fat. This, however, is a minor physical property.

A cold cream having very desirable properties can be made by using the above formula except for the addition of 250 parts of water instead of 100. The method of mixing the various substances is of prime importance. The petrolatum, alcohol, lanolin and paraffin are melted together. The water is warmed to the same temperature as the melted fats and added slowly with constant grinding so as to get a smooth mixture.

Microphotographs of hydrous wool fat, the substitute, and cold cream have been taken and are shown below.

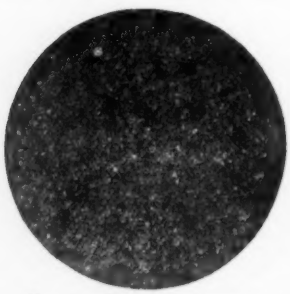


FIG. I.—HYDROUS LANOLIN.
(Wool fat with 30 percent water.)
Average cost per pound, 40 cents.

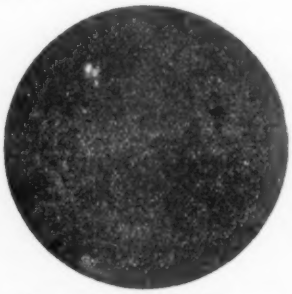


FIG. II —WOOL FAT SUBSTITUTE.
55 to 75 percent cheaper than hydrous lanolin.

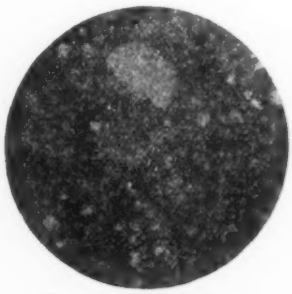


FIG. III.—COLD CREAM.
80 to 90 percent cheaper than hydrous lanolin.

The writer believes that the wool fat substitute described in this paper will stand competition with wool fat and "Eucerin," both now and under normal conditions.

A further investigation is under way to determine the value of ceryl alcohol, $C_{27}H_{55}OH$, from Chinese wax and myricyl alcohol, $C_{30}H_{61}OH$, from Carnauba wax for the same purpose for which cetyl alcohol, $C_{16}H_{31}OH$, from spermaceti was put to, namely, in the preparation of a wool fat substitute.

In conclusion, due credit is hereby given to Mr. Sol. Bernstein, who spent considerable time in performing experiments and assisting in general to bring this paper to a successful issue.

1. *Berichte*, Vol. 29, p. 2890.
2. JOURNAL A. PH. A., Vol. I, p. 673.
3. *Ibid.*, Vol. II, p 971.
4. *Proc. Royal Society of Medicine*, London, 1911–1912, p. 220.
5. *Dermatologische Zeitschrift*, Vol. 6, p. 158.
6. *Berichte*, Vol. 13, p. 1416.
7. *Ibid.*, Vol. 16, p. 1721.
8. *Ibid.*, Vol. 17, p. 1627.
9. *J. Biol. Chem.*, Vol. 20, p. 121.
10. *Berichte*, Vol. 3, p. 616.

OTHER REFERENCES.

Jahresberichte, 1862, p. 413.
Journal für praktische Chemie, Vol. 43, p. 148.
Annalen, Vol. 131, p. 283.
Ibid., Vol. 83, p. 16.
Berichte, Vol. 28, p. 3135.
Ibid., Vol. 29, p. 618.
Ibid., Vol. 29, p. 1474.
Ibid., Vol. 31, p. 97.
Ibid., Vol. 31, p. 1122.
Apoth. Zeit., Vol. 20, p. 857.
Journal für praktische Chemie, Vol. 9, p. 321.
J. Society Chem. Industry, Vol. 11, p. 134.
Ibid., Vol. 15, p. 14.
"Technology of Oils and Fats," by Lewkowitsch, p. 239.
Allen, "Organic Analysis," Vol. 2, Fourth Edition, p. 479.

HOCHSTADTER LABORATORIES,
NEW YORK CITY.

METHODS OF ANALYSIS OF ACETYLSALICYLIC ACID AND ADULTERANTS.

BY HENRY L. SCHULZ.

With the collaboration of C. K. Glycart, A. W. Hanson and A. E. Stevenson.

In the spring of 1915, about ten months after the outbreak of the European war, the supply of acetylsalicylic acid was practically exhausted. The stocks still held by a few dealers were being offered at an advance of about two hundred percent above the market price of the previous year. Owing to the scarcity of synthetic drugs of foreign origin, the "drug peddlers" and "drug brokers" who had been dealing in these products were unable to supply the demand and, not wishing to lose an opportunity to profit by the advanced prices, resorted to unscrupulous methods to obtain material for their trade.

Information that acetylsalicylic acid was being adulterated reached the Department in the early part of June 1915. An investigation was begun and samples collected and analyzed. These samples, mostly tablets, showed a marked variation in composition. Some were pure acetylsalicylic acid, others contained only small amounts, and a number did not contain any. As the combinations of substances found in the spurious samples differed widely, it was concluded that several manufacturers were adulterating acetylsalicylic acid, and steps to locate them were immediately taken. After some difficulty, consignments of spurious acetylsalicylic acid were found to have originated in Cleveland, Indianapolis, Memphis, St. Louis and Chicago. For the purpose of hiding their identity and to make it more difficult to trace shipments, some of these adulterators would use fictitious shippers' names and addresses on the packages sent out by them.

Previous to 1917, before the patent on acetylsalicylic acid expired, its sale was restricted in this country, and reputable wholesale druggists refused to handle it except under the trade name "Aspirin." As stated above, most of the acetylsalicylic acid was sold by drug brokers and peddlers who frequently carried their entire supply in a trunk or suitcase and disposed of it in such quantities as the druggist or dealer might wish to buy. A number of the shipments sent to brokers and peddlers by these adulterators were located and immediately confiscated by inspectors of this Department. The investigation showed that some of these manufacturers would deliver the unlabeled, spurious mixture to manufacturing pharma-

ceutical houses to have it compressed into tablets, while others would do their own compressing. The extent to which this fraud was perpetrated can be estimated when it is considered that one of these adulterators sold over twelve hundred pounds of this product in one month. This same manufacturer did not confine his activities to acetylsalicylic acid, but also made adulterated ichthyol, creosote, carbonate, potassium guaiacol, sulphonate, etc., samples of which were collected and analyzed. Most of these unscrupulous manufacturers have already been tried and convicted in the United States Courts, and several were sentenced to serve a term in prison.

During this investigation scores of samples of acetylsalicylic acid were collected and analyzed. While many of these were pure, the majority consisted of one of the following combinations:

1. Acetanilid or acetphenetidin, citric acid, salicylic acid, and milk sugar.
2. Acetanilid, salol, salicylic acid, and milk sugar.
3. Acetylsalicylic acid, milk sugar, and starch. (The tablets contained only 20 percent of the amount declared.)
4. Milk sugar, alum, and acetanilid.
5. Acetylsalicylic acid and salol.
6. Milk sugar, starch, and calcium acid phosphate.
7. Tartaric acid, milk sugar, and boric acid, both with and without acetanilid.
8. Acetanilid and tartaric acid.
9. Milk sugar, cream of tartar, and salicylic acid.
10. Milk sugar and cream of tartar.

Owing to the variation in composition of these samples, the usual methods for examining acetylsalicylic acid could not always be followed. Therefore special methods were compiled for the qualitative and quantitative analyses of the different combinations. These are given below.

Acetylsalicylic acid usually occurs in the form of colorless crystalline needles with an acidulous taste. It is soluble in 100 parts of water and freely soluble in alcohol, ether and chloroform. Its melting point is usually given as 135° C. A number of apparently pure samples were found to melt as low as 130° C.

QUALITATIVE TESTS.

Since many samples contain a very high percentage of chloroform-insoluble material, better results will be obtained by applying the qualitative tests to the chloroform-soluble substances and chloroform-insoluble substances after they have been separated. The taste of the insoluble residue will readily indicate sucrose, acids, or acid salts if present.

Free Salicylic Acid.—Shake 0.5 Gm. of the sample with 10 Cc. of cold water and filter the liquid. Add a drop of dilute ferric chloride solution to the filtrate. This should not produce more than a very faint violet color. If boiled with water for several minutes acetylsalicylic acid is hydrolyzed and the addition of ferric chloride to the filtrate will produce a deep violet color characteristic of salicylic acid.

Salicylic Acid and Salol.—Boil. 0.5 Gm. of the sample with 10 Cc. of normal sodium hydroxide for two minutes, cool, and add an excess of dilute sulphuric acid. Acetic acid will be liberated and delicately violet-colored crystals of salicylic acid will be precipitated. These crystals, when washed and dried, should melt at 157°. If phenyl salicylate (salol) is present, the odor of phenol will be recognized on acidifying. Salol may frequently be recognized by its characteristic odor.

Acetanilid.—Heat 0.2 Gm. of the sample with 5 Cc. of a ten percent solution of potassium hydroxide; then add 0.1 Cc. of chloroform and again heat. The odor of phenylisocyanide should not be evolved.

Acetphenetidin.—Heat 0.2 or 0.3 Gm. of the sample with 10 Cc. of dilute nitric acid. If an intense yellow color develops, acetphenetidin is indicated.

Sugars, Starch or Salts.—0.5 Gm. of the sample should be completely soluble in 15 Cc. of chloroform or alcohol.

Test any chloroform-insoluble residue for starch with iodine.

The presence of lactose is indicated (*a*) if a yellow color develops on boiling a 0.5 Gm. sample with potassium hydroxide solution, (*b*) if a water solution of the chloroform-insoluble residue reduces Fehling's solution.

Inorganic Impurities.—Shake two Gm. of the sample for several minutes with 25 Cc. of water, filter and test separate portions of the filtrate for metals, chlorides, sulphates, carbonates, borates and phosphates, according to the usual qualitative methods prescribed for these substances in the Pharmacopoeia, or other standard books.

QUANTITATIVE METHODS.

Substances Determined in the Original Sample.

Ash.—The residue of the ignited powder should not be over 0.2 percent. (On compressing acetylsalicylic acid into tablets some inert binding and lubricating materials are generally added which may increase the ash.)

Acetylsalicylic Acid.[1]—The following double titration is very satisfactory when examining pure acetylsalicylic acid or tablets containing the usual excipients sugar, starch and talc, since these substances do not interfere with the titration. In the presence of acids, acid salts, salol, etc., the method is not satisfactory.

Weigh 0.3 Gm. of the finely powdered material into an Erlenmeyer flask, dissolve as quickly as possible in about 10 Cc. of cold neutral alcohol (95 percent), add a drop of phenolphthalein solution, and titrate with $\frac{N}{10}$ potassium hydroxide. Note the volume of $\frac{N}{10}$ alkali required, then add a volume of the alkali equal to that required for the first titration plus 5 Cc., and place the solution on a steam bath for 15 minutes. Titrate the excess of alkali with $\frac{N}{10}$ acid.

If the product is pure the total amount of alkali required should be twice that of the first titration. Each cc. of $\frac{N}{10}$ alkali is equivalent to 0.009 Gm. acetylsalicylic acid.

If free acids are present, the amount of acetylsalicylic acid may be calculated by multiplying the number of Cc. of $\frac{N}{10}$ alkali required for the second or hot titration by 0.018.

The cold titration should be made with as little delay as possible since the acetylsalicylic acid hydrolyzes very rapidly liberating acetic and salicylic acid, which would require more alkali to neutralize than the original substance. If salol is present the odor of ethyl salicylate will be noticed after heating the alcoholic mixture.

Total Salicylates.[2]—Dissolve 1 Gm. of the material in a slight excess of dilute alkali, heat on a steam bath for 15 minutes, then carefully transfer to a separatory funnel, acidify with hydrochloric acid, and extract with from 3 to 5 25-Cc. portions of chloroform to remove all traces of salicylic acid from the mixture. Treat each portion of chloroform extract in succession in a second separator with 20 Cc. of water containing 1 Gm. of anhydrous sodium carbonate for every 100 mg. of salicylic acid to be neutralized. Shake the solutions vigorously, and after separating the layers wash each portion of chloroform in another separator with 5 Cc. of water. On completion of this operation, unite the water layer with the main aqueous soda solution. Dilute the alkaline solution to a known volume, transfer an aliquot representing about 100 mg. of salicylic acid, to a 200 Cc. Erlenmeyer flask, and dilute to about 100 Cc. Heat the solution nearly to boiling; then add from a burette 25 to 40 Cc. of strong (about $\frac{N}{5}$) iodine solution, sufficient to insure an excess of this reagent during digestion and heat the mixture for an hour on the steam bath. Discharge the free iodine with a few drops of thiosulphate solution, decant the clear liquid

through a tared Gooch filter, care being taken that most of the precipitate remains in the flask. To the latter add 50 Cc. of boiling water. Digest for 10 minutes on the steam bath; then filter, gradually washing all the reddish substance into the Gooch filter with 200 Cc. of hot water, dry at 100° and weigh. Multiply the weight of precipitate by the factor 0.4016 to obtain the quantity of salicylic acid present in the aliquot.

Substances Soluble in Chloroform.—Separation of constituents (in mixtures containing sugar, inorganic salts, salicylic acid, acetphenetidin, and acetanilid, with little or no acetylsalicylic acid).

Accurately weigh 2 or 3 Gm. of the finely powdered sample into a counterpoised filter, and wash it with successive small portions of chloroform to extract all the soluble substances. The last portion of the chloroform should be dropped along the upper edge of the filter to remove any crystals which may have formed. Collect the solvent in a tared dish, evaporate at 60°, dry and weigh the residue, redissolve in 10 Cc. of cold 95% alcohol, add a drop of phenolphthalein solution, and titrate with $\frac{N}{10}$ alkali. Calculate the acidity as salicylic acid. Add an excess of 0.5 Cc. of $\frac{N}{10}$ alkali, and heat on a steam bath for 2 or 3 minutes. If the solution is partly or completely decolorized, acetylsalicylic acid or salol is indicated. (Salol will produce ethyl salicylate, which is readily detected by its wintergreen-like odor.)

Transfer the titrated solution to a separatory funnel, using 20 Cc. water and 25 Cc. of chloroform to wash the dish. Then add about 10 Cc. of 1% potassium hydroxide solution, shake, and when the two liquids have separated, carefully transfer the chloroform to another separator. Repeat the extraction twice, using 15 and 10 Cc. chloroform. Filter the chloroform into a tared dish, evaporate, dry and weigh. This residue contains the acetphenetidin, acetanilid, and salol.

Combine the aqueous washings and reserve for the determination of total salicylates. The melting point of the chloroform residue should be determined and other tests that may be necessary to identify the residue should be made. Acetanilid melts at 115°, acetphenetidin at 135°, and salol at 42°.

Acetanilid and acetphenetidin may also be determined by the following methods:

Acetanilid.[3]—Transfer 0.30 Gm. of the chloroform-soluble residue redissolved in chloroform to a 200 Cc. flask, add 10 Cc. of dilute sulphuric acid (1 to 10 by volume), and heat on a steam bath until the volume is reduced to 5 Cc. If the odor of acetic acid is present, add 10 Cc. of water and continue the digestion until the liquid is again reduced to 5 Cc.; then cool, transfer to a separatory funnel with water, so that the final volume does not exceed 20 Cc. Add 30 Cc. of chloroform, shake the mixture gently for 1 minute and, after the layers have separated, withdraw the lower layer through a small dry filter. Repeat the extraction with 20 and 15 Cc. chloroform. Discard the chloroform and carefully draw off the aqueous acid solution remaining in the separator into an Erlenmeyer flask. Rinse the filter and funnel with several 5 Cc. portions of water to remove all traces of the former contents. Heat the liquid on a steam bath for 10 minutes to expel the chloroform. After cooling, add 10 Cc. of concentrated hydrochloric acid. Run in gradually, and with frequent shaking, a standard solution of potassium bromide-bromate until a faint yellow color persists. From the amount of standard solution required calculate the percentage of acetanilid in the chloroform-soluble residue, as well as in the original mixture.

The standard bromide-bromate solution is prepared as follows: Dissolve 50 Gm. of potassium hydroxide in a small quantity of water. Add a slight excess of bromine, dilute with water to dissolve any separated salts, boil to expel excess of bromine, and dilute to 1 liter. Standardize the solution against well-dried, recrystallized acetanilid, adjusting the solution so that each Cc. is equivalent either to 5 or to 10 mg. of acetanilid.

Acetphenetidin.[4]—Proceed as directed under "Acetanilid" up to and including the extraction of the hydrolyzed acid mixture with chloroform. Treat the aqueous acid solution of phenetidin sulphate remaining in the funnel with successive small portions of solid sodium bicarbonate until an excess of the former persists at the bottom of the mixture. Add 50 Cc. of chloroform

and, for every 100 mg. of acetphenetidin present, 5 drops of acetic anhydride. Shake the mixture vigorously for some time, allow the layers to separate, and withdraw the chloroform into a second separator containing 5 Cc. of water. Shake this mixture, and after separation pass the lower layer through a small dry filter into a 200 Cc. Erlenmeyer flask. Distil over about 40 Cc. of the chloroform, using the distillate for further extraction. Make a second and third extraction of the original aqueous solution and wash and distil as before. Completely transfer the chloroform residue to a tared 50 Cc. crystallizing dish or beaker, evaporate on the steam bath to apparent dryness, and finally remove any considerable excess of acetic anhydride by repeated additions of 1 Cc. of fresh chloroform to which has been added a drop of alcohol.

The regenerated acetphenetidin should finally appear as a white, crystalline mass, with a faint acetous odor. The latter will completely disappear on standing some hours in the open or in a vacuum desiccator over lime. Weigh the residue from time to time until the final weight differs from the preceding not more than 0.05 mg.

Salol.[5]—If salol is substituted for acetylsalicylic acid, its presence is readily detected in the chloroform-soluble residue by qualitative tests, odor, and by the melting point (42° C.). In mixtures containing salol, acetanilid, or acetphenetidin, the salol may be determined by difference or by titration with standard bromide-bromate solution.

1. *Salol by Difference.*—In 0.3 Gm. of the chloroform residue determine the amount of acetanilid or acetphenetidin by acid hydrolysis as directed in the methods for acetanilid. To determine the amount of salol, subtract the weight of acetanilid or acetphenetidin found from the weight of chloroform residue taken.

2. *Salol by Alkaline Hydrolysis.*—Heat the chloroform-soluble residue from 1 Gm. sample with 20 Cc. of 2.5 percent caustic alkali on a steam bath for 10 minutes, cool and transfer quantitatively to a separatory funnel. Extract the solution with four 30 Cc. portions of chloroform. Discard the chloroform and transfer the alkaline solution from the separatory funnel into a 200 Cc. graduated flask. Wash the funnel, add the washings to the flask, and make up to the mark with water. Take an aliquot representing not more than 75 mg. salol, add an excess (about 45 to 50 Cc.) of standard bromide-bromate solution, and follow this with 10 Cc. of concentrated hydrochloric acid. Close the flask and shake 1 minute; then shake at intervals over a period of $^1/_2$ hour. At the end of this time add 10 Cc. of 15 percent potassium iodide solution, agitating the closed flask at intervals for 15 minutes. Titrate the free iodine with standard thiosulphate previously adjusted to the standard bromine solution, 1 Cc. of which is equivalent to 0.001784 Gm. salol. From the number of Cc. of standard bromine solution required, calculate the salol on the basis of 12 atoms of bromine to 1 molecule of salol.

If salicylic acid also is present the amount should be determined on a separate portion of the chloroform-soluble residue by dissolving a known weight of the residue in 10 Cc. of alcohol, adding 10 Cc. of water and 2 drops of methyl red indicator, and titrating with $\frac{N}{10}$ alkali. One Cc. of $\frac{N}{10}$ alkali represents 0.0138 Gm. salicylic acid. The amount of salicylic acid found, as well as the amounts of acetphenetidin or acetanilid found, should be subtracted from the weight of the residue taken, if salol is determined by difference.

If Method 2 is used in the presence of salicylic acid the quantity of standard bromide-bromate solution required for the salicylic acid must be deducted before the amount of salol is calculated.

SUBSTANCES INSOLUBLE IN CHLOROFORM.

The chloroform-insoluble residue remaining on the filter paper after the original extraction with chloroform is allowed to dry in the air. It is weighed and is

then washed with water until all water-soluble matter has been removed. The residue on the filter consists of starch, talc, etc., while in the aqueous solution the following adulterants, if present, will be found:

Alum, boric acid and salts, citric acid and salts, tartaric acid and salts, phosphates, and milk sugar.

Make the solution to a known volume and in aliquots determine:

Acidity	Alum
Reducing sugars	Citric acid
Phosphoric acid	Tartaric acid

according to methods outlined in Leach "Food Inspection and Analysis," John Wiley & Sons, or *Journal of the Association of Official Agricultural Chemists* (1916), "Methods of Analysis," Williams & Wilkins Co., Baltimore.

REFERENCES.

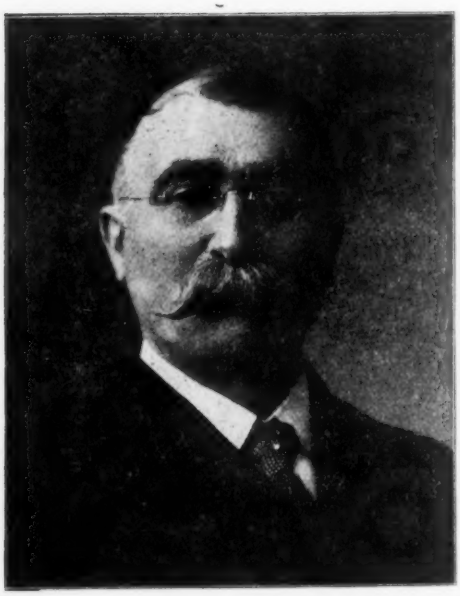
1. Allen, "Commercial Organic Analysis," 4th Edition, 1910, Vol. III, p. 504.

2. Emery, "Headache Mixtures," U. S. Dept. Agriculture, Bur. of Chemistry, *Bull.* 152, p. 327. Also *Jour. A. O. A. C.* (1916), Vol. II, "Drugs," p. 351–358.

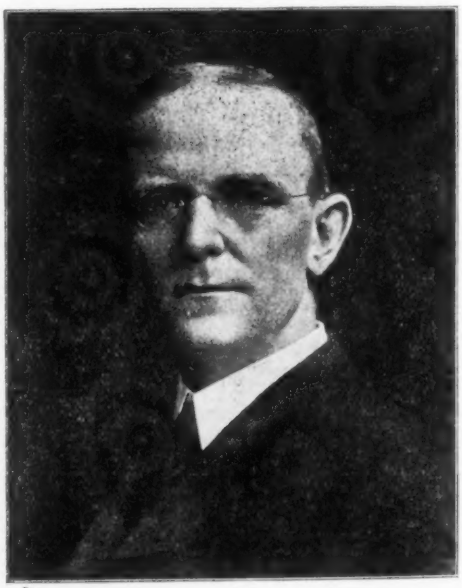
3. Emery, "Headache Mixtures," U. S. Dept. Agriculture, Bur. of Chemistry, *Bull.* 132, p. 197.

4 and 5. Emery, *et al*, "Estimation of Phenacetin and Salol in Admixture," *J. Ind. Eng. Chem.* (1915), p. 681.

FOOD AND DRUG LABORATORY,
CHICAGO, ILL.



JOHN G. GODDING, BOSTON, MASS.
Elected Member of Council, A. Ph. A., to succeed Thomas F. Main, deceased



JOHN C. WALLACE, NEW CASTLE, PA.
Retiring Chairman of National Drug Trade Conference

PRACTICAL PHARMACY SECTION

EMERGENCY SUBSTITUTES FOR SUGAR, SYRUP AND GLYCERIN.*

BY CURT P. WIMMER.

In bringing the subject of emergency substitutes for sugar, syrup and glycerin before you at this time, I hope that no one will take from this paper the impression that I advocate the illegitimate use of substitutes in any manner, shape or form. The word "substitute" has an unpleasant flavor in American pharmacy and the "substitutor" in normal or abnormal times is an unprincipled scoundrel who fully deserves whatever punishment the law provides for him.

Neither do I desire to appear before you as an alarmist who proclaims that sugar and glycerin will shortly disappear from the market or that their use for medicinal purposes will be prohibited by the government. On the contrary, I have entire confidence that our government will at all times see to it that a moderate supply will be available for medicinal uses.

This paper is written with only *one* object in view, and it is the following: Our country is engaged in a great war, in a war which requires that all of our resources be mobilized and strained and used for the successful prosecution of the conflict. It is the first duty of every good and loyal citizen to support the government, heed its warnings and to coöperate to the best of his ability. We are at present in the midst of a scarcity of sugar. The government has asked us to use as little of it as possible, so as to insure at least a moderate supply wherever it is needed most urgently. Glycerin also is becoming more and more scarce, a fact evidenced by the slow but steady increase in price for this substance. What, then, can the pharmacist do to assist the government? Can he get along with less sugar and glycerin in his preparations? Can he do without them altogether? What substances or preparations might possibly be used to advantage in their places?

It is the object of this paper to answer these questions. For purposes of simplicity, the paper is sub-divided into two parts, *viz.*, (1) Sugar and Syrup Emergency Substitutes, and (2) Glycerin Emergency Substitutes, and under each heading will be included a brief review of relevant conditions and means of meeting them, as found in some of the other warring countries. Most of the information regarding the latter has been gained by a careful perusal of recent foreign publications, especially of *The Chemist and Druggist* of London.

Another fundamental question must be answered: Are the quantities of sugar and glycerin used in compounding medicines so large, that their continued unrestricted use for this purpose might become embarrassing to the food administrators? Without hesitation I say "Yes." To my regret, I have no statistics available giving the amount of sugar or of glycerin used by the pharmaceutical profession

*Read before New York Branch A. Ph. A., December meeting, 1917.

and the drug trade, but no doubt it is very large. And furthermore, much of it, I believe, can be saved to be used either to feed the mouths of the hungry, or to be made into explosives.

About three months ago, the General Council of Medical Education of England have, by authority vested in them, altered and amended the British Pharmacopoeia and have withdrawn seventy-three preparations, with only one object in view: to save sugar and glycerin. The following preparations have been made unofficial:

(1) All Confections (except pepper and rose)

(2) All Glycerites

(3) All Mixtures (except chalk, compound iron and castor oil mixtures)

(4) All Syrups (except syrupus, chloral, codeine phosphate, iron iodide, iron phosphate with quinine and strychnine, glucose)

(5) All Troches (except krameria, cocaine, morphine, morphine and ipecac)

Also: Effervescent Citrated Caffein
Compound Decoction of Aloes
Saccharated Solution of Lime
Honey and Borax
Compound Almond Powder
Compound Licorice Powder
Suppositories of Glycerin
Compound Tincture of Cardamom
Tincture of Kino
Tincture of Wild Cherry
Comp. Tincture of Rhubarb
Comp. Tincture of Senna
Ointment of Iodine.

Surely this momentous action would not have been taken, had not actual experience shown its advisability. We may well take a lesson from countries who have been in the war longer than we have been. The withdrawal of these preparations has opened up a number of interesting questions. One of them was to the effect that, legally, this withdrawal made automatically official the older formulas which had been superseded by those withdrawn. Another point raised was that all of these important preparations were, by this withdrawal, left without any standard of any kind, a prey for the unscrupulous. The Council recently announced that they would publish substitute formulas to be used in place of the official ones, and a pamphlet regarding them is probably in the hands of the English pharmacists by this time.

The English pharmacist does, of course, not dispense any of these preparations without affixing to the container a label, showing the words "War Emergency Formula," followed by a statement to the effect that although the formula of the preparation has been changed, its physiological activity has in no wise been altered. At the same time, physicians are being requested to cease prescribing the deleted galenicals.

In our own Pharmacopoeia, sugar and glycerin are made use of in many preparations. They are, in part, the following:

Compound Licorice Powder contains.....50% sugar
Compound Chalk Powder contains.....50% sugar
Aromatic Elixir.....31.8% sugar
Saccharated Ferrous Carbonate.....70% sugar
Aromatic Fluidextract Cascara Sagrada contains.....20% volume glycern
Glycerites: Tannic Acid.....80% weight glycerin
Starch.....80% weight glycerin
Boroglycerin.....69% weight glycerin
Hydrastis.....50% volume glycerin
Phenol.....80% volume glycerin
Solution Magnesium Citrate.....14.5% w/v sugar
Mass of Ferrous Carbonate.....25% sugar
Mucilage of Tragacanth.....18% weight glycerin
Suppositories of Glycerin about.....85% weight glycerin
Syrups: Acacia.....80% sugar
Citric Acid.....70% sugar
Hydriodic Acid.....57.50 volume syrup
Orange.....82% w/v sugar
Orange Flower.....85% w/v sugar
Calcium Lactophosphate.....65% w/v sugar
Ferrous Iodide.....57.5% weight sugar
Hypophosphites.....60% w/v sugar
Ipecac.....70% w/v sugar + 10% volume glycerin
Lactucarium about.....65% w/v syrup + 20% volume glycerin
Tar.....85% w/v sugar
Wild Cherry .....80% w/v sugar
Rhubarb.....85% volume syrup
Rhubarb Aromatic.....85% volume syrup
Sarsaparilla Compound.....75% volume syrup
Squill.....80% w/v sugar
Squill Compound.....83% volume syrup
Senega.....80% volume syrup
Senna.....75% volume syrup
Tolu.....82% w/v sugar
Ginger.....82% w/v sugar
Tinctures: Gentian Compound.....10% volume glycerin
Lactucarium.....25% volume glycerin
Rhubarb.....10% volume glycerin
Rhubarb Aromatic.....10% volume glycerin
Troches: Acid Tannic.....80% sugar
Ammonium Chloride.....50% sugar
Potassium Chlorate.....80% sugar
Sodium Bicarbonate .....65% sugar
Ointments: Acid Tannic.....20% weight glycerin
Iodine.....12% weight glycerin

This list is not given for the purpose of recommending the deletion of some of the formulae for the period of the war, although some such step may yet have to be taken, if the present scarcity of sugar continues, or if the supply of glycerin be withdrawn from the open market. But the list shows to what extent sugar and glycerin are used in galenical pharmacy. Add to this the amount of sugar used in the numberless proprietary remedies and you will have an idea of the total used for medicinal purposes.

In discussing various substitutes, let us not forget that they cannot be reasonably expected to be the equal in all respects of the substance they are to replace.

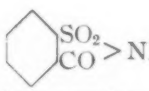
Sugar and glycerin owe their general use to the fact that they each have a number of valuable and divers properties, which make them so useful to us. A substitute for sugar, for example, cannot be expected to have *all* of the physical and chemical properties of sugar. If, however, we succeed in devising a preparation which, in a *given galenical*, will satisfactorily replace the sugar, then the substitute must be called a success. So, for different classes of galenicals, or even for certain individual preparations, different substitutes may have to be used. The nature of the substitute will depend entirely, in each case, upon the especial property of the sugar or glycerin which we desire to impart.

In England, the wholesale manufacturing as well as the retail pharmacist must make application to the local food controller for a sugar supply for the coming year. This application must be made on special blanks, which require the following information: 1—Class of manufacture. 2—Stock of sugar on hand. 3—Amount of sugar used in 1915. 4—Quantity applied for. 5—Usual supplies. 6—Remarks.

At this writing the food controller had allowed to manufacturing pharmacists 50 per cent of the total amount used by them in 1915.

1. SUGAR AND SYRUP EMERGENCY SUBSTITUTES.

In arranging the various properties of sugar according to their relative importance, in medicinal preparations, I should unhesitatingly say that, first, sugar is used because of its taste, second, because it preserves, third, because it imparts consistence or bulk, and, lastly, because it has a slight physiologic action. For purposes of substitution the last-named property must at once be discounted, since the sugar of a preparation depending in its physiological action solely upon this substance simply cannot be replaced by anything else. Such "medicines" I will exclude from consideration here. To impart to preparations a sweet taste, nothing is more suitable than saccharin.

Saccharin, or O-sulphamino benzoic acid anhydride,  , discovered accidentally by Fahlberg in 1878, is a microcrystalline powder, soluble in water 1 : 290, melts at 220° C. It is about 500 times sweeter than sugar, and, therefore, at least as cheap as sugar if it can be bought for about $40 a pound. The price of saccharin to-day is quite unsettled, but the amount of the substance that might be used in medicinals would be so small that the matter of cost would hardly play an important part. I believe that saccharin will come into its own through this war. In spite of the reports of eminent authorities that saccharin is harmless if taken in small quantity, this substance has become almost an outlaw in many countries. No doubt, economic and political considerations had something to do with the making of the laws against its use, but such considerations do not hold now and the question of a limited use of this substance in galenicals might well be discussed. Professor Joachimoglu, of the University of Berlin, is reported to have recently stated that after extensive experiments and observations during this war, he is convinced that saccharin is harmless. Professor E. R. Watson, of the University of Leeds, recommends its use in solution. In the city of Manchester, signs in various shops advertise saccharin as being "better and cheaper" than sugar. The Italian government permits the sale of an artificial sugar, a dilution

of saccharin 6 to dextrose 1000, in the pharmacies. Unfortunately, a vicious rumor has been spread in certain Italian localities among the ignorant, that this artificial sugar may cause cancer, and so the pharmacists are having a hard time trying to dispose of it.

Very recently, the *Société de Thérapeutique* of France passed resolutions requesting the government to permit the use of a saccharin-dextrose mixture, 1 : 1000, for sweetening purposes. It is, however, not be used in jams, chocolates and other articles of food.

I might also direct your attention to the report on saccharin of the Referee Board of the American Medical Association. This report shows that saccharin in small quantities, 0.3 Gm. per day or less, is without deleterious or poisonous action, that in larger quantities, especially over 1 Gm. per day, when taken for a considerable period of time, it is liable to produce disturbances of digestion. Again I ask that my position in this matter be not misunderstood. I believe that under no circumstances should the use of saccharin be permitted in any preparation which depends for its use entirely or in part, upon the presence of sugar, especially in those used as a food.

The property of syrup of lending consistency and, in more limited degrees, of preserving, may well be imparted to galenicals by glucose, or similar substances, such as honey, invert sugar, manna or molasses, or mixtures of these. The proposition most frequently met with in English current publications is to take glucose, dilute it with water to the specific gravity of syrup, 1.313, then to boil and strain and to add some chloroform. This preparation is claimed to keep for months.

Acting upon this suggestion, I procured some liquid glucose and diluted it to the desired specific gravity, but found that the viscosity of this preparation was very much higher than that of the U. S. P. syrup. Inasmuch as the specific gravity seemed to me a less desirable standard to use than viscosity, I prepared several mixtures of glucose and water and by the aid of Engler's viscosimeter established that a mixture of $66^2/_3$ percent by volume of glucose with water at 25° C. has approximately the same viscosity, or fluidity, as the official syrup. Next, I procured some Karo syrup (Crystal White brand) of the Corn Products Manufacturing Company, and established by a series of experiments that a mixture of 75 percent of this Karo with 25 percent (by volume) of water, at 25° C. has a viscosity practically the same as that of official syrup. With the kind assistance of some of our students, a series of taste experiments was carried out, with a view of establishing the relative sweetness of the various syrups. Dilutions ranging from 1 : 10 up to 1 : 200 were prepared and the concentration at which the sweet taste was first tasted distinctly, was determined. We found the following ratio:

Syrup, U. S. P., taste appears in dilution 1 : 110.

Glucose, $66^2/_3$ percent volume, taste appears in dilution 1 : 25.

Karo, 75 percent volume, taste appears in dilution 1 : 35.

Taking the sweetness of official syrup as one, it appeared that the glucose preparation was 0.227 and the Karo preparation 0.32 as sweet.

Glucose is rated to be about one-third as sweet as sugar, and basing upon this ratio, and, furthermore, upon the ratio 1 : 500 for relative sugar-saccharin sweetness, I expected that about 1.20 Gm. of saccharin would have to be added to every 1000 mils of glucose syrup to get the same relative sweetness as that of official syrup. We found, however, that sweetness cannot, with safety, be calculated by a rule of

mixtures. On making dilutions and tasting them, we found that 1.35 Gm. of saccharin are required to every 1000 mils to approximately impart the same degree of sweetness to the glucose syrup as the sucrose syrup possesses. Similar experiments made with the Karo syrup showed that 1.20 Gm. of saccharin are required for every 1000 mils of 75 percent volume syrup. The formulae read, consequently, as follows:

WAR EMERGENCY FORMULA I.		WAR EMERGENCY FORMULA II.	
Glucose, liq.....	667 mils	Karo, crystal white.....	750 mils
Water.....	333 mils	Water.....	250 mils
Saccharin.....	1.35 Gm.	Saccharin.....	1.20 Gm.

The saccharin dissolves readily upon applying heat to the syrup.

Such a preparation would, no doubt, answer very well in a number of medicinal preparations in place of syrup. It might have to be modified to suit especial cases, but that could easily be accomplished. Let us, however, not forget to mention possible objections to the use of this syrup. Liquid glucose usually contains traces of sulphur dioxide, about 200–300 parts per million. A glucose syrup cannot be used with any substance easily susceptible to reduction, and finally a glucose syrup is not as permanent as a sucrose syrup. The tendency to fermentation may, however, be overcome by an addition of a small amount of chloroform.

On the other hand, a glucose syrup might be even more advantageously used in cases where a reducing substance tends to retard decomposition as in ferrous preparations or hypophosphites. I have prepared a number of galenicals, which I submit to your kind judgment. They are syrup of hydriodic acid, syrup of ferrous iodide, syrup of rhubarb and syrup of tolu, also compound licorice powder. In the latter preparation the sugar has been replaced by a mixture of saccharin 1.50 to pure white dextrose 1000 parts. English pharmacists recommend the use of a mixture of almond meal 8 parts, and acacia 1 part, or of starch, or of a corn-meal-saccharin mixture in this case. I find the dextrose-saccharin mixture to be the best. Another substance, which, of late, has come into somewhat extensive use in place of sucrose in ice cream is invert sugar. It is somewhat sweeter than sugar, and its usefulness in the preparation of galenicals might also be looked into. Honey and manna must be mentioned. Manna is said to be especially serviceable for use with, and in the preservation of, iron preparations.

II. GLYCERIN EMERGENCY SUBSTITUTES.

The manufacture of glycerin for medicinal purposes has been discontinued in England for quite some months past, and pharmacists must be content to use whatever stocks may still be on hand. When this is used up, no further supply will be obtainable. They are looking forward to the time when they will have to do without this substance, altogether with some apprehension, for it cannot be readily replaced. They feel that the disappearance of glycerin from pharmaceutical uses would be a calamity.

In suggesting substitutes for glycerin they follow lines laid down by various investigators in Germany, where the glycerin shortage has been acute almost from the beginning of the war. Prominent among them was Dr. E. P. Unna who claims that a good glycerin substitute must have the following properties:

1—It must have fatty properties, but must not be sticky.

2—It must be hygroscopic, must not decompose at high temperature nor solidify at low temperature.

3—It must be inodorous, non-poisonous, non-irritating and have an agreeable taste.

Substitutes for glycerin are very numerous, and for simplicity's sake they may be subdivided into five classes as follows:

a—Solutions of gums, glues or other viscous substances, such as agar-agar, fish glue, Iceland moss, linseed, marshmallow root, salep, tragacanth. The principle objection to these preparations is that they require the addition of a preservative, borax, formaldehyde, etc. In this connection, I might mention that acetanilid is claimed to have been found a good preservative for mucilages. A number of preparations of such type are on the market in Germany, for example:

Lempellin, a mucilage of Irish moss preserved with borax and formaldehyde.

Algin, an infusion of laminaria stalks with sodium carbonate.

Novoglycerin, a solution of glue in water.

Glycerit, a quince seed mucilage, containing 10 percent of glycerin and a small amount of borax.

b—Solutions of sugar.—About 60 percent of sugar is required to obtain a liquid of about the same fluidity as glycerin.

c—Mixtures containing fats or oils.—Since glycerin has the advantage of freedom from greasiness, oils and fats should be present in a substitute in a diluted form, preferably emulsified. A German preparation, Proglycerin, is a diluted lanolin emulsion. Paraffin emulsions may also be used.

d—Solutions of certain salts.—These solutions are used whenever the hygroscopic property of glycerin is the one desired in the substitute. A solution of calcium chloride, 36 percent, is used for medicinal purposes. Perglycerin is a 45 percent solution of sodium lactate; Perkaglycerin a 60–80 percent solution of potassium lactate.

e—Various mixtures not classifiable under any one of the above.—A solution of magnesium chloride, 21 percent, with 60 percent glucose is claimed to be well adapted for technical purposes. A mixture of equal volumes of 2 percent gelatin solution and glycerin gave a good preparation.

We see that the range of glycerin substitutes is a very wide one indeed, but the following general considerations may help to simplify the problem before us:

1—In preparations where physiological activity depends entirely upon the presence of the glycerin, substitution should not be attempted at all. Examples of such preparations are: Glycerite of boroglycerin, glycerin suppositories, and compounds of glycerophosphates. Physicians might be requested to refrain from prescribing them.

2—In the case of preparations whose glycerin content is either small or non-essential, the glycerin might be omitted entirely or its amount might be reduced to a minimum. Examples of such preparations are: Ointment of iodine, compound tincture of gentian, mucilage of tragacanth, and others.

Glycerin is used extensively in hair tonics, face lotions and creams. To save this amount, the druggist might be advised to make a good lotion or cream of his own and to recommend it whenever glycerin is wanted for the purpose. I take the liberty of quoting you several formulae recommended by the *Chemist and Druggist.*

1—Benzoinated Lard..... 15 grains
Powdered Hard Soap..... 20 grains
Mucilage of Quince Seed... 1 1/2 ounces
Camphor Water..... 1 1/2 ounces

2—An Almond Lotion:
Almonds blanched..... 40 grains
Rose Water..... 1 1/2 ounces
Orange Flower Water..... 1 1/2 ounces
Bruise the almonds and triturate then add:
Borax..... 12 grains
Tincture of Benzoin..... 10 minims

3—Soft Soap..... 20 grains
Anhydrous Wool Fat..... 15 grains
Almond Oil..... 1/2 drachm
Water..... 2 ounces
Mucilage of Carraghean.... 1 ounce
Essence of Lily-of-the-valley 15 minims

4—A very fine cream is obtained by the following formula:
White Wax..... 1 drachm
Spermaceti..... 1 drachm
Wool Fat..... 1/2 drachm
Zinc Oxide..... 2 drachms
Spirit of Camphor..... 1/2 drachm
Radium Water..... 1/2 drachm
Cucumber Juice..... 1 ounce
Sesame Oil..... 2 1/2 ounces
Synthetic Oil of Rose..... 10 minims

I have prepared some of these creams, and have them here. They are very good indeed.

To replace glycerin in hair tonics, I find "turkey-red oil" recommended. This is sodium sulpho-ricinoleate. It is miscible with water. To replace glycerin in preparations where "body" is required, the London Pharmaceutical Committee recommends the following preparations:

Gum Tragacanth	30	grains
Chloroform	24	minims
Water, to make	10	ounces

For internal use, the following is claimed to be more suitable:

Gum Tragacanth	2	drachms
Alcohol	4	drachms
Chloroform Water	10	ounces

Another formula suggested is the following:

Picked Carragean	1	ounce
Water	25	ounces

And finally, another one:

Washed Irish Moss	1/2	ounce
Water	24	ounces

Keep boiling for fifteen minutes, strain with pressure, make up to 19 ounces with boiling water and add 1 ounce of glucose. Mix and strain.

I have prepared some of these mucilages and, they are here for your inspection. Some of those used in Germany are also included.

The subject of war emergency formulae is certainly a very important one at this time. It seems to me to be even worthy of official consideration by the American Pharmaceutical Association. War emergency formulas might be worked out by a properly constituted committee, certain definite propositions made and duly legalized. Congress would surely not stand in the way, nor would State officers refuse to coöperate. By judicious effort of this nature, the American Pharmaceutical Association would make itself of great assistance to both the government and the profession. To the government such assistance would, no doubt, be most welcome, and it would be the carrying out, in a measure, of the promise of support made to President Wilson at the outbreak of the war. To the pharmacist, advice as to what he should do and can do in this emergency would be most valuable. When common substances become scarce, the pharmacist will do the best he can (which in many instances is the worst) and, furthermore, the temptation to illegal substitution becomes great.

Let us not wait until we are asked to do it, but let us be prepared. In our national emergency don't let us be followers, let us be leaders for the country's good.

THE PREPARATION OF DICHLORAMIN T. AND CHLORINATED EUCALYPTOL 1.2.*

BY ROBERT B. KRAUSS.[1]

Para-toluol-sulphondichloramide was first prepared by Kastle, Keiser and Bradey[2] in 1896, who also prepared a number of related compounds. Since its introduction under the name of dichloramin T. by Dakin, Lee, Sweet, Hendricks and LeConte,[3] the production of this substance on a large scale in pure form, as

---

EDITOR'S NOTE.—See also comment on this paper under Local Branches, this issue.

*Read before Philadelphia Branch A. Ph. A., December meeting, 1917.

[1] Henry Phipps Institute of the University of Pennsylvania.

[2] *American Chemical Journal*, 18, 491, 1896.

[3] *Journal American Medical Association*, 69, 27, 1917.

well as that of suitable solvents for its application, have become problems of importance.

As originally used for this purpose dichloramin T. was dissolved in a prepared eucalyptol (chlorinated) and used in this condition or further diluted with prepared paraffin oil (chlorinated).

It was early recognized by the author that the products obtained by chlorination may vary considerably, according to the conditions of chlorination. By continued chlorination, under certain conditions, a chlorinated eucalyptol, specific gravity 1.2, is obtained, which has been extensively studied by surgeons. As a solvent for dichloramin T. it seems to have all the desirable qualities with the exception of the solution being definitely stable. There seems to be some reason to believe that chlorinated eucalyptol 1.2 itself has some therapeutic value.

This evening I will present an outline of the methods for preparing para-toluol-sulphondichloramide, and chlorinated eucalyptol 1.2, and the specifications for both as prepared for federal medical authorities.

1. PREPARATION OF THE SULPHONIC ACIDS.

Beginning with toluol, the sulphonic acids are formed by mixing equal parts of concentrated sulphuric acid and toluol. On shaking or even on standing the toluol dissolves in the acid. When the top layer of toluol has disappeared the sulphonation mixture is poured into water and neutralized with lime. After filtering, the solution of the ortho and para calcium sulphonates is treated with sodium carbonate and boiled to form the sodium salts and precipitate calcium carbonate. The filtered solution is evaporated to dryness and carefully dried.

2. PREPARATION OF THE SULPHOCHLORIDES.

The powdered sodium sulphonates are treated with an equal weight of phosphorus pentachloride. After the pentachloride has disappeared the semifluid mass is heated on the water bath to complete the reaction and then poured on ice. The para-sulphochloride crystallizes after a time while the ortho derivative is a liquid. They are separated by centrifuging.

3. PREPARATION OF THE SULPHONAMIDE.

The para-sulphochloride is melted on the water bath and treated with an excess of ammonium carbonate. The odor of sulphochloride should no longer be observable. The mixture of ammonium carbonate and sulphonamide is extracted with water and dried. If the sulphonamide is not pure white it should be recrystallized from hot water.

4. PREPARATION OF THE DICHLORAMIDE.

The toluol-para-sulphonamide is dissolved in ten parts of 1 : 10 caustic soda (39° Bé.) and diluted with twenty parts of water. The solution is filtered through glass wool and then through double filter paper. This removes iron hydroxide from the strongly caustic solution.

Chlorine gas from a cylinder is then passed through the solution, cooled externally by ice, until a voluminous white precipitate of para-toluol-sulphondichloramide is formed. This is filtered off, thoroughly washed twice with 5 to 8 parts of water and finally with enough 10 percent alcohol to make a thin paste. The dilute alcohol washing should be done very quickly and the substance filtered off with the aid of a vacuum filter. It is then dried at a temperature not exceeding 55° C. in a vacuum dryer.

The method has the advantage that it is very rapid and avoids the use of chloroform as a solvent. It was developed in order to produce a dichloramin T. which would be comparatively stable. The product has a negligible ash and a good chlorine content, but no free chlorine on standing.

Calculated: Cl = 21.54 percent. Found: Cl = 21.42 percent; 21.37 percent.

The very considerable work done in the chemical laboratory of the Institute on the preparation and distribution of dichloramin T. for surgical purposes has suggested the following specifications as most suitable for this material when used as a disinfectant:

PHYSICAL PROPERTIES.

White powder or crystals with slight yellow-green tinge. Melting point, 78–84° C.

CHEMICAL PROPERTIES.

Soluble in cold chloroform with slight to no turbidity. (Any turbidity must be removable by shaking with anhydrous calcium chloride.) Soluble in prepared eucalyptol, Dakin and chlorinated eucalyptol 1.2. Ash, not over 0.2 percent; chlorine content, 29.0 percent to 29.54 percent; calculated chlorine, 29.54 percent.

The solubility in chloroform or similar organic solvent is important in that it shows the presence of inorganic impurities, calcium salts, etc. The material should not have strong odor of chlorine, showing instability. The melting point may vary within the limits indicated, owing to moisture. Sharp drying will decompose the substance.

SOLVENTS.

The eucalyptol, as first proposed[4] by Dakin and Dunham, was chlorinated with potassium chlorate and hydrochloric acid according to the following method:

Five hundred Cc. eucalyptol (U. S. P.) are treated with 15 Gm. potassium chlorate and 50 Cc. concentrated hydrochloric acid. After twelve hours the oil is well washed with water and sodium carbonate solution. Dry sodium carbonate is added to the oil and the mixture is allowed to stand twenty-four hours. It is then filtered and dried with a little calcium chloride.

This method has the disadvantage that no definite amount of chlorine enters the eucalyptol. The chlorination depends on the rate of adding chlorate and hydrochloric acid as well as the light in which the process takes place. Samples may have 1 percent chlorine present or scarcely any, depending on whether chlorination took place in sunlight or on a dark day. The specific gravity of this oil may vary from 0.930 to 0.935.

PREPARATION OF CHLORINATED EUCALYPTOL 1.2.

It was found that by passing chlorine gas from a cylinder into eucalyptol the reaction proceeded much further than by the chlorate method heretofore described. When a specific gravity of 1.20 was reached a comparatively heavy oil, much less volatile than eucalyptol, was obtained.

The results of the use of this oil are well known to-day; briefly, it was found that it is a good solvent for dichloramin T., that it can be used in full strength on the skin and in open wounds and that the use of paraffin oil either as a diluent or as a means of preventing sticking of dressings is unnecessary.

The following is a sufficiently detailed statement of the method by which this oil is obtained:

Through a glass tube reaching to the bottom of a five-gallon bottle containing about 10 kilos of eucalyptol is passed chlorine from a cylinder. The oil should have a boiling point of 176–177° C. and a specific gravity of 0.925 to start. The process should be carried on in good daylight.

During the chlorination the temperature rises and should be kept below 80° C. by regulating the chlorine stream. Hydrochloric acid is given off and may be absorbed in alkali.

When a specific gravity of 1.19 is reached the oil is chlorinated sufficiently and the process is interrupted. The oil is then washed with about four liters of water, then shaken thoroughly with 250 Gm. dry sodium carbonate and allowed to settle. After carefully decanting from the carbonate, about 500 Gm. fused calcium chloride are added and the whole again shaken. On standing preferably over night, the oil is filtered, bottled and is then ready for use. It is a white or slightly amber-colored oil, specific gravity 1.2, with a chlorine content of about 31 percent. Such an oil will readily dissolve 20 percent of dichloramin T. which solution may keep in an amber bottle without decomposition for a month.

FURTHER PRODUCTS OF CHLORINATION.

By further chlorination of the 1.2 oil, products may be obtained having a specific gravity of 1.5 and higher. This may be carried out by chlorinating directly at 100° C. or with a solvent such as chloroform at its boiling point. The oil of specific gravity 1.4 is amber colored and of the

[4] Dakin and Dunham, *British Medical Journal*, June 1917.

consistency of molasses. The dichloramin is still soluble, although to a less extent. The future may find a use for this type of oil, since the increased viscosity presents an advantage in certain cases.

Dichloramin T. prepared as heretofore described is freely soluble in chlorinated eucalyptol 1.2. The solutions should be prepared about as follows:

PREPARATION OF $7^1/_2$ PERCENT SOLUTION.

Measure off 150 Cc. of oil into a dry brown bottle, preferably one with a glass stopper. Add to this 11.5 Gm. powdered dichloramin T. This will dissolve, if shaken occasionally, in about an hour. It should *not* be warmed. This makes a $7^1/_2$ percent solution, and is used for all dressings subsequent to the first two or three applications. This solution should keep for at least two weeks. If this is used in an atomizer, as directed, it has been found that one filling of the usual atomizer reservoir will dress from 100 to 150 cases.

PREPARATION OF 20 PERCENT SOLUTION.

This solution should be made up about 25 Cc. at a time, using 5 Gm. of dichloramin T. to 25 Cc. of oil. It is most quickly accomplished by trituration and the solution should be kept in a brown bottle. This is applied to fresh wounds and for the first treatment of infected wounds and focal infections. It is most conveniently applied with an ordinary medicine dropper. This solution is good until a crop of fine crystals appears in it, which may happen in three days, although it may remain in good condition for ten or more days.

When using the solution in an atomizer, the reservoir of which is of colorless glass, the solution should be protected against light as light greatly accelerates the decomposition of dichloramin T. in solution. The following points should receive consideration in its clinical use:

1. Surgical asepsis, as perfect as possible, should be used at both the primary operation and subsequent dressings.

2. At the primary operation all wound surfaces should be covered and all crevices filled with the 20 percent solution. Subsequent dressings are made with the $7^1/_2$ percent solution.

3. Before the oil is applied the surfaces of the wound should be as dry as possible; free from blood and water.

4. Drainage should be avoided in all wounds closed by suture.

5. It has been suggested that with local infections, such as boils, carbuncles and abscesses, an incision be made somewhat earlier than usual and the 20 percent solution of dichloramin T. freely applied will very often sharply limit the progress of the infection.

6. This preparation is essentially non-irritating unless confined by unduly heavy or impervious dressings. If so confined, it may blister.

In conclusion I wish to acknowledge the coöperation of Doctors P. A. Lewis and W. E. Lee, and also the assistance of Miss Elizabeth Hill, in the chemical manipulations.

MAJOR D. A. COSSAR.

According to latest advice, Major D. A. Cossar, who was expected in this country, has been in Egypt; from there he will go to France. Mention was made in the JOURNAL, p. 922, October issue.

COMMERCIAL SECTION

THE PRECEPTOR—AN ASSET OR A LIABILITY?*

BY FRANKLIN M. APPLE.

From the definition of the word "preceptor" given by standard authorities, theoretically, there should be but one answer to this query: an affirmative one as an asset; but from customs in vogue in some establishments, branded drug stores, and from experiences had with employees from such shops, one is compelled, with reluctance, to decide that some preceptors are liabilities to those who have the misfortune to be in their employ.

The preceptor in the drug business should realize that he assumes a moral responsibility to his employees, who place a measure of faith in his integrity and business judgment when he takes them into his employ; hence he should exercise great caution that the embryo pharmacist, at the most impressionable time in his life, be directed along proper lines of action, which action upon the clerk's part will depend in large measure upon the customs that prevail in the establishment over which the proprietor has supreme command, as the rules of the store will automatically be indelibly impressed upon the mind of the faithful employee.

The advantages (or disadvantages) of the direction of the preceptor will be in direct proportion to the faithfulness of the employee, and we all know that the faithful employee is the only sort the good pharmacist is solicitous of employing.

When serving my apprenticeship, I was skeptical concerning rumors to the effect that in some few establishments very low wages were received by the tyro-pharmacists there employed; but after a quarter century's active service in the role of a pharmacist, and observing the varying value of various employees, I have no doubt as to the aforesaid rumors, and the great advantages enjoyed by those who had the good fortune to be under the direction and supervision of truly representative, responsible employers, who were mindful of the obligations to their employees. The advantages of such a line of action are not unfair or unbalanced ones, as far as the preceptor is concerned, for the the proverbial shortage of *good* help is one that does not annoy such a one; because there will be competition to enter his employ upon the part of intelligent employees, and other employers make appeals to him for positions for their wards when attending college, if located in a city where a college of pharmacy is operated.

As it will be necessary for the employee to carry out the processes of manufacture in a drug store that is properly conducted, it is self-evident that he will become familiar with such processes and facilities for manufacturing, which knowledge and practice will prove to be of lasting benefit to him as a clerk or as an employer.

It is said that the clerk of to-day is the proprietor of tomorrow, hence it can readily be seen that he stands to gain very materially by having been in the employ of a first-class pharmacist.

---

* Read before Section on Commercial Interests, A. Ph. A., Indianapolis meeting, 1917.

Reversely, it is advantageous to the employer to properly train his employees, for, if they become proprietors, they will assist in keeping up the standards of the business as a matter of custom or second nature, and he surely will feel the advantages that such customs will produce.

If the clerks have had desirable practices to follow when employed, they are not likely to want to follow less desirable ones when directing their places of business. They will be more prone to yearn for, and determine upon more pleasing and more comfortable conditions, which will lead to a far better state of affairs for all followers of the calling.

As a nation, we have been notorious as squanderers of our resources, showing but little regard for the affairs of to-morrow, but, with the advent of the unprecedented conditions that prevail to-day, it is very important that we take time to take account of stock, as it were, and plan with far more deliberation for the future than we have done in the past.

These are stirring and heart-rending times and each and every one should as a patriotic duty seriously consider how he can contribute to the welfare of the nation.

If careless financial methods have been followed, they should be discontinued immediately in self-defense to proprietor and clerk, for then the proprietor may be able to pay the clerk a better salary.

If slovenly practices have been followed, to the great detriment of the budding pharmacist, the proprietor should "wake up" or competition will eliminate him as an employer in the near future, for business is making very rapid strides along the lines of cleanliness and order.

If questionable business morals are the basis on which a drug store is conducted, the sooner a clerk severs his connection with the place the better it will be for him, as he cannot afford to run the risk of the evil effects of such environment.

If an employer does not prove to be what he morally obligates himself to be to the clerk—a preceptor or teacher—when he requests him to enter his employ, the drug clerk is being treated dishonestly and unfairly and should keep on the lookout for an employer who will faithfully carry out his part of the bargain made when hiring the novice.

As the majority of employers are close observers of the habits of their employees and realize their obligations to their worthy employees, it is incumbent upon the latter to prove their worthiness of confidence, and to instill into the minds of their masters the fact that it will not be a waste of time and effort upon the part of the preceptor to allot a certain portion of each day's time, if possible, to the improvement of their pupils, realizing that they will receive the benefit from such action by the improved service the employees can and will render to them.

I shall never forget the systematic course of study I was compelled to follow by my first employer in the drug business, and I feel certain that the habits then formed have been a lasting benefit to me; and I certainly recommend that all employers, if possible, demand that a certain course of reading and study be followed by their employees—particularly so by those just entering the drug business.

The ex-employees of some of our first-class drug stores are known as one of ——'s boys, to which they allude with pride (and in many instances with great

profit), as they now appreciate the great opportunity it was to them to have been in the employ of such an employer.

As the brand trade-mark on some lines of manufacture inspires confidence in the goods bearing said marks, so the record of having served a satisfactory apprenticeship with proprietors of certain standing gives their ex-employees credentials that are of great benefit and value; hence the selection of a preceptor is a very momentous question for the young man entering pharmacy, and no hasty decision should be made upon this question, for the years of employment, while acquiring the degree of pharmacist, are but a small portion of the years the average clerk is connected with pharmacy.

Preceptors in pharmacy should realize the moral obligations they assume when employing clerks and should govern themselves accordingly. A full realization of those obligations will soon bring about a decided improvement in the quality of clerks; also establish the drug business upon a higher plane, with better financial rewards.

The opportunity is at hand. Will it be embraced?

Time only can give the answer; but may our generation not be compelled to be ashamed of its record, and deliberately throw away the golden opportunities that are at hand, for America has a new era awaiting for all alert, honorable, intelligent workers.

WOMEN IN PHARMACY TO-DAY.

BY R. A. KUEVER.

During the past three years European countries have witnessed the advent of women in fields hitherto controlled entirely by men. Inspired by patriotism, women offered their services in offices and factories where their help, at first a grateful addition, soon became a real necessity. With the duration of the war came multiplication of their tasks, until women's sphere included the most menial labor in mines and ammunition plants. They have borne their added responsibilities bravely and capably, sacrificing equally with the men folk in order to do their bit.

America will witness the same spectacle in the months to come—is witnessing it now in a small way. With us, however, it is different in that our women are afforded time to fit themselves for the work. The delay in placing our fighting forces in the field has enabled the majority of our men to continue their business undisturbed, or to substitute other men in their places. Women have shown an ardent desire to serve, and in many places girls are being employed to run elevators, page lobbies and perform similar tasks. But by far the greater number are serving by conserving and knitting—nor would I undervalue that service—but it must be materially increased and broadened as our man power decreases.

How can I best serve is the question confronting thousands of wide-awake American women, who are looking into the future welfare of our country. There is no field which offers greater opportunities than pharmacy. The demand for skilled pharmacists has never been as great, the salaries have never been so large,

and the number of available pharmacists never has been so small as it is at present —three very good reasons why more women should enter that field. Not only that, it is work for which women are admirably fitted. It does not require hard manual labor; it is clean, pleasant work, which any scientifically trained woman can do admirably and enjoy doing. Calls for registered pharmacists are constantly being received which cannot be filled because so many of the young men in that profession have entered some branch of our national service, and many more will be called to the colors this winter.

Our professional colleges feel the loss of the young men who have responded so promptly to their country's call, but their places are bound to be filled by women who realize in this their opportunity for service. The percentage of women in professional training is decidedly on the increase. At the State University of Iowa this year, seventeen percent of those registered in the College of Pharmacy are women. Another year it will be even greater, for women are quick to avail themselves of the double opportunity to earn their livelihood and at the same time do their bit.

WARNING AS TO CRUDE DRUGS.

Because of the discovery of as much as 25 percent of dog fennel in recent shipments of chamomile and of foreign materials in other crude drugs, the United States Department of Agriculture warns dealers and shippers to purchase only on explicit specifications. When imported, or shipped in interstate commerce, or when offered for sale in the Territories or the District of Columbia, crude drugs are adulterated within the meaning of the Food and Drugs Act if their strength or purity falls below the professed standard or quality under which they are sold. If the drug is sold under or by a name recognized in the United States Pharmacopoeia or National Formulary, it must conform with the requirements thereof as to strength, quality, and purity. If it differs therefrom, and the name recognized in the Pharmacopoeia or Formulary is retained, then the bottle, box, or other container must bear a plain statement of its own standard of strength, quality, or purity.

A WORD FROM THE TREASURER.

The A. Ph. A. fiscal year runs even with the calendar year. The annual payment for 1918 was due January 1. The bills were mailed to the members December 17, 1917. It is gratifying to state that at the present writing, January 5, the treasurer has received 725 payments for 1918. A prompt response from the other members will save the association the expense of mailing a second bill.

New Year's greetings to all from

HENRY L. WHELPLEY,
2342 Albion Place, St. Louis, Mo.

SECTION ON EDUCATION AND LEGISLATION

MINUTES OF THE SECOND SESSION OF THE SECTION ON EDUCATION AND LEGISLATION, A. PH. A., INDIANAPOLIS MEETING.

The second session of the Section on Education and Legislation was called to order at 9.30 A.M., Friday, August 31.

The first order of business was the reading of the report of the Committee on Regulations for the Transportation of Drugs by Mail. It was ordered that the report take the usual course. The report follows:

REPORT OF THE SPECIAL COMMITTEE ON REGULATIONS FOR TRANSPORTATION OF DRUGS BY MAIL.

At the time of this Committee's last previous report the Kern-Doremus bill was under consideration by Congress. It promised to be the most important step yet recorded in the movement to provide for the transmission of poisons through the mails. Toward the close of the same year, 1916, the Postmaster-General, with a somewhat similar object in mind, submitted some recommendations which were made part of the customary Postoffice Appropriation bill. But the two plans of relieving the situation were found to be quite different, and, in fact, to differ so radically that a sharp controversy arose between the drug trade and the Postoffice Department over which form should be enacted.

The Kern-Doremus measure provided for the carrying through the mails of drugs of all kinds whether poisonous or not, with proper safeguards as to packing, etc., written into the law. Such legislation would be important and would give relief not alone to the drug trade but to all interested in the arts and sciences. This movement had the almost unanimous endorsement of the drug trade, one of the most important organizations backing it being the National Drug Trade Conference. The Postmaster-General in his recommendations sought to amend Section 217 of the Penal Code, which relates to the prohibition of all kinds of poisons, explosives, inflammable matter, etc., from transmission through the mails, so that he would have power without restriction to make regulations governing the carrying of drug poisons in the mails.

He would have the law permit the shipment of poisons, etc., between responsible parties, as between manufacturer and jobber, jobber and retailer, and the like. The Drug Trade Section of the New York Board of Trade and Transportation was also reported to be supporting this measure.

Neither bill has been passed. In the case of the Kern-Doremus bill, Congress adjourned by limitation March 4th before it was reached, and the present session is of course only concerned with war measures. As for the Postmaster-General's amendment to Section 217, it was thrown out of the Postoffice Appropriation bill on a point of order to the effect that it was new legislation on a general appropriation bill. There seems, therefore, to be no hope of change in the existing conditions before the next regular Congress.

Respectfully submitted,

B. L. MURRAY, *Chairman.*

The following papers were read, discussed and referred for publication:

"Some Ideas about the Teaching of Practical Pharmacy," by Zada M. Cooper. (See p. 1065, December 1917.)

"The U. S. P. IX and N. F. IV as Text Books for Pharmacognosy," by W. F. Gidley. (See p. 809, September issue.)

"Iowa's Prerequisite Law," by J. M. Lindly. (See p. 928, October issue.)

"What Compulsory Health Insurance Would Mean to the Druggist," by Harry B. Mason. (See p. 881, October issue.)

It was ordered that reprints be made of Mr. Mason's paper and sent to the legislative committee of each state association.[1]

On motion of J. H. Beal and second of Wm. C. Anderson, the resolutions presented by Mr. Mason were also approved by vote of the Section. (See p. 890, October issue.)

[1] Reprints have been sent out as instructed.—*Editor.*

F. W. NITARDY: Prohibition confronts us in many states at this time. The Colorado Prohibition Law did not specifically include alcohol, but did by the inclusion of spirituous liquors or preparations that might be used as intoxicants.

We endeavored to have passed an alcohol bill, defining the status of alcohol and legalizing its use for strictly legitimate purposes, but were unsuccessful. Through the influence of the Denver Branch of the A. Ph. A., we succeeded in having the druggists of Colorado restrict the sale of alcohol to a form of bathing alcohol denatured to an extent that it could not be used internally; namely, by making a mixture of alcohol and water and tartar emetic and selling this as bathing alcohol.

We went about the work very carefully and tried the mixture out, and then asked for a joint meeting with the Denver County Medical Association, when we submitted the formula to them, and put up our arguments why we would like to have their approval of this particular formula for an alcohol for external use. After three joint meetings we succeeded in getting the unanimous approval of this association, and then we published the formula very widely. We wrote to all the state officials and the people that were behind the prohibition forces, giving it very wide publicity, and getting all the druggists behind it, and the result was that there was not any beverage alcohol sold in the State of Colorado after the dry law went into effect. The only alcohol sold was the so-called bathing alcohol.

Two years later we went before the legislature, and we had then placed ourselves sufficiently in the confidence of the prohibition forces so that we were able to pass our Alcohol Law. Experience had taught us a lesson or two that made our final alcohol law just a bit different from our original idea of it.

I have with me here the Alcohol Law of the State of Colorado which I want to offer to this Section for other states to follow, if they happen to have prohibition legislation that endangers the legal status of alcohol. We all know how important alcohol is to the drug business, and that we cannot afford to have its use and importation into the state so restricted that it can be only prescribed in four ounce quantities by a physician.

The particular part I want to offer to this Section is the two formulas that we use in our State Law. Section 4 of our law reads as follows:

SECTION 4 OF COLORADO ALCOHOL LAW.

It shall be lawful for licensed wholesale or retail druggists to purchase and sell alcohol denaturized under either one of the two following formulae:

(1) Tartar Emetic, U. S. P.	1.00 Gm. (58 grains)
Solution of Formaldehyde, U. S. P.	2.60 mils (1/2 fluidounce)
Distilled Water	475.00 mils (48 fluidounces)
Alcohol	650.00 mils (83 fluidounces)
To make about	1,000.00 mils (1 gallon)

Dissolve the tartar emetic in the water, add the formaldehyde solution, then the alcohol and mix well. And to comply with the following test:

If 100 mils of bathing alcohol prepared in accordance with this formula be evaporated to dryness on a water bath and then heated in an air bath at 100° C. for fifteen minutes, or until all of the formaldehyde is dissipated, the residue obtained should respond to the test of identification given under Antimony and Potassium Tartrate in the U. S. P., and should require not less than 5 mils of tenth-normal Iodine V. S., when assayed according to the U. S. P. process, corresponding to not less than .083 Gm. of tartar emetic per 100 mils of bathing alcohol.

(2) Croton Oil, U. S. P.	1 mil (62 minims)
Ether	19 mils (2 1/2 fluidounces)
Solution of Formaldehyde, U. S. P.	4 mils (1/2 fluidounce)
Alcohol, U. S. P.	976 mils (125 fluidounces)
To make about	1,000 mils (1 gallon)

Dissolve the croton oil in the ether, then add the alcohol and formaldehyde and mix well. And to comply with the following test:

If 100 mils of bathing alcohol prepared in accordance with this formula be evaporated on a water bath until the alcohol and ether have been dissipated, the residue dissolved in about 10 mils of ether, filtered, the filtrate evaporated on a water bath until the odor of ether is no longer perceptible, the oily residue, after heating in an air bath at 100° C. for fifteen minutes, should weigh not less than .085 Gm. nor more than .100 Gm. and correspond to the tests of croton oil as given by the U. S. P.

Provided, that such denatured alcohol shall bear the following form of label when sold or offered for sale:

BATHING ALCOHOL

Formula No.—

FOR EXTERNAL USE ONLY.

POISONOUS IF TAKEN INTERNALLY.

Then our law permits the sale of the regular so-called denatured alcohol. I want to explain that in constructing these formulas we found by experience that the amount of water mentioned in formula No. 1 is necessary to hold in solution the amount of tartar emetic we have in the formula. We found that unless we could put that much tartar emetic in the preparation it was not of much use. We found people could drink it if less amount was present.

This formula for bathing alcohol has been used by every druggist in Colorado for two years or more, and we have had only one complaint that it was unfit, irritating or objectionable in any way for external use. The Federal Government has published about thirteen different formulas that can be used to denature alcohol. This alcohol may be sold without a U. S. Revenue license. The one complainant wanted one of the other formulas used. The druggist poured in a little oil into the same bathing alcohol, thinking that the objection was more imaginary than a real one, and this customer came back later on and commented on how much better this particular bottle of alcohol was, stating that none of the irritating effects she had noticed in the other was present.

One reason for being anxious to bring this before the Association is that in the August JOURNAL OF THE A. PH. A., p. 700, Dr. Otto Raubenheimer wrote an article mentioning this to some extent and stating that we were very much mistaken in the idea that we could sell an alcohol of this kind without a liquor license. It started up a little commotion two days before I left Denver. I took the trouble to go to the Revenue Office in Denver and made careful inquiries in regard to that, and I find that the statements in this article of the JOURNAL differ with their views. An alcohol of this kind can be sold by any one without the Federal liquor license, and some action should be taken at this meeting to correct the wrong impression that has been sent out through the article mentioned.

I want to further explain the presence of formaldehyde in both of these formulas. That is done so that this will comply with the federal regulation which exempts us from the tax. The U. S. Government permits thirteen different mixtures of alcohol and other things to be sold as a denatured form of alcohol without license, and one of those is a mixture of one part of formaldehyde and two hundred and fifty parts of alcohol, known as Formula No. 3; that mixture is considered sufficiently denatured so as to make it unfit for internal use. You probably will realize that one part of formaldehyde in two hundred and fifty parts of alcohol would not keep some persons from drinking it, and we found that to be true in Colorado.

THE CHAIRMAN: I believe that Mr. Nitardy's very able presentation of this topic will more than correct Mr. Raubenheimer's paper, so that I do not believe any action on the part of this body is necessary. Is there any discussion?

DISCUSSION.

C. M. WOODRUFF: Before the members of this Association act upon the expressed opinion of the Collector of Internal Revenue in Denver, or anywhere else, it should be confirmed by the Commissioner of Internal Revenue.

Now, I may be incorrect, but my opinion is that the Commissioner of Internal Revenue at Washington has very recently pointed out that it is unlawful for druggists, who have not paid a special tax applying to the sale of alcohol, to sell these special denatured alcohols that have been recently authorized. I am under that impression, though not certain. You get all kinds of opinions from collectors. I obtained one kind through our New York office from a New York collector and another kind from our Detroit office from a Detroit collector, and when I was not satisfied I got an opinion from the Commissioner of Internal Revenue at Washington.

Another suggestion, has any effort ever been made to have these formulas authorized by the Commissioner of Internal Revenue so as to save the expense of using tax-paying alcohol in making these bathing solutions? Now, in considering that you must bear in mind that in these recent special denaturing formulas the Commissioner has limited the privilege of producing these to several distilling plants having denaturing licenses, I think we had better go slow before we conclude that the tax is not required.

F. W. NITARDY: Mr. Chairman, may I answer Mr. Woodruff's question? I have with me Treasury Decision No. 1843, and Mr. Woodruff's first question will be answered by reading one sentence from this decision. Reading:

"If, however, the alcohol before sale is rendered by the apothecary unfit for beverage uses in accordance with any formula approved for the destruction of the identity of alcohol in scientific institutions and hospital departments (see Treasury Decision 1757) no tax liability will be incurred."

We have been selling in the State of Colorado without federal license for three years, this particular mixture, and have had no trouble with the Internal Revenue Department. The article in the JOURNAL started up a discussion in Denver and I went to the trouble to find out if there was anything later than this Treasury Department Decision on the subject, and was informed by the Internal Revenue Department that there was no later decision, and there had not been any other rulings on the subject.

The other question asked by Mr. Woodruff, whether tax-free alcohol could not be obtained for this purpose, is also something we took up in Colorado. I wrote to the Secretary of the Treasury in an effort to have something done along that line, but we were turned down.

W. C. ANDERSON: A question is raised here on which there is an entire difference of opinion. In fact, if this goes out before the druggists of this country there will be hundreds of them fined for violation of the law. In my opinion, Mr. Nitardy is wrong and Mr. Raubenheimer is right. This is of vital importance and I think we ought to have it settled.

I would like to ask Mr. Nitardy if he submitted any questions with reference to this tax and these formulas to the Internal Revenue Department at Washington.

F. W. NITARDY: We did. We submitted not only our formula, but our state law, to the Internal Revenue Department with the request that we be permitted to have tax-free alcohol used in preparing this, stating that it was being sold without a liquor license as evidence that it was not a liquor. We received some lengthy correspondence on the subject, showing the reason why it could be sold without a license, but that tax-free alcohol could not be used in the manufacture of it without amending the revenue laws of the country.

W. C. ANDERSON: The situation is really this: that a druggist cannot denature alcohol and sell it for bathing purposes by either the formula you have given or any of the formulas printed in that circular, according to the Commissioner's own assertion. This matter was taken up in the King's County Pharmaceutical Association some years ago and I sent that very decision you have there to the Commissioner asking him if retail druggists could denature their alcohol in conformity with that law and sell it without tax, and his answer was positively no, and that those formulas were intended for institutions such as hospitals, and so forth.

I find that inspectors of the Internal Revenue Department, even collectors, make vital mistakes. We had one of the collectors in New York State tell a druggist that unless he took out a license and paid the tax he could not keep alcohol on hand for making tinctures, which was not a fact; so your collector, while he may not prosecute anyone in Colorado for doing as you are doing, he is not substantiated by the statements made, and the regulations at Washington. I cannot give you the number, but there is a pamphlet that gives the regulations so far as denatured alcohol is concerned, and it states that denaturing of alcohol will not be allowed by the Government, and sale of that denatured alcohol by the person denaturing it is prohibited, except it be by a denaturing plant licensed by the Government and under its supervision. You cannot denature alcohol for making tincture of iodine and sell it, but we have manufacturing houses selling tincture of iodine to the druggists to-day. That becomes denatured alcohol, but that tincture of iodine has to be made in a denaturing plant licensed by the Government. If a doctor writes a prescription for the formula you have there the druggist can compound it without being subject to the tax. If a physician writes a prescription containing tartar emetic and those other ingredients, a druggist can compound it without being subject to the tax; but a druggist cannot put those ingredients in the alcohol himself and denature it and sell it over the counter without

being subject to the tax. That comes direct, as I say, from Washington, because we in New York State had considerable trouble over the same question and made a thorough investigation and got all the information from that particular source. I do not want the druggists of the country deceived on this proposition.

F. W. NITARDY: Mr. Chairman, I believe Dr. Anderson has several Treasury Decisions confused. There are two decisions that give this same set of thirteen formulas. One I have in my hand; the other I have not with me, because I thought it of no use for this argument. It designates the same thirteen formulas for the purpose of denaturing tax-free alcohol to be used by hospitals and scientific institutions. That is Treasury Decision No. 1757. That particular Treasury Decision uses tax-free alcohol, this is an entirely different proposition from the alcohol the druggist buys from his jobber.

All the claim that I am making is that the druggist can use tax-paid alcohol and denature it according to Government requirements and sell it without the retail liquor dealer's license. That explanation was given to me in the Internal Revenue Office and it is clear from the reading of this decision.

OREL JONES: I would like to back up Dr. Anderson. I have at home the written decision of the Commissioner saying these formulas can be used on prescriptions only and not by the retail druggists for general sale.

S. L. HILTON: The statement of the gentleman is correct. Further, I want to add that when you do sell that alcohol that is tax-paid and denatured by yourself, without the internal revenue retail liquor dealer's license, you assume also the burden in case that product is used for beverage purposes, you are then guilty and will be so handled by the federal authorities.

F. W. NITARDY: I would like to ask of these gentlemen who have different opinions on this subject, how the druggist is permitted to make tincture of iodine and sell it without a liquor license. It was stated that it was a denatured form of alcohol, so the druggist, according to your statements, has no right to make tincture of iodine and sell it.

W. C. ANDERSON: A druggist can make any tincture. He can manufacture anything in his place with alcohol without paying the tax, but he cannot make tincture of iodine and then claim, from the Government, a return of tax paid on that ethyl alcohol; a denaturing plant licensed by the Government to denature alcohol can make tincture of iodine from grain alcohol and iodine and get a return on the tax.

F. W. NITARDY: We do not ask for any return of revenue on the denatured alcohol we sell. I ask how it is that a druggist can sell tincture of iodine without a retail liquor dealer's license?

W. C. ANDERSON: Because he can sell any preparation.

F. W. NITARDY: In the form of a medical preparation, a liniment, and so forth? In what manner does that medicinal preparation, this formula I have read, differ from some other liniment containing alcohol that is intended for external use and is unfit for internal use?

W. C. ANDERSON: The difference is that the Government examines every preparation on the market to discover their alcoholic and their medicinal content. They examine U. S. P. and N. F. preparations. They are medicinal preparations, compounds, and so recognized. They do not base their decision on the amount of alcohol contained. It may contain three percent of alcohol or ninety-five percent, but they base their decision on the amount of medicinal ingredients in the preparation. If there is enough medicine to make it a medicinal compound and not liquor, they do not list it as liquor. It may only contain five percent of alcohol and be listed as a liquor and the person who sells it has to pay the tax.

F. W. NITARDY: According to that the burden of proof is with the Government. Until these formulas are listed as liquor they will go tax-free.

W. C. ANDERSON: The burden of proof is upon the person selling the preparation. Mr. Nitardy is taking an awful responsibility. I am asking if he will not consider this matter carefully and look into it fully before he allows his present conclusions to get out among the retail drug trade.[1]

THE CHAIRMAN: We will now hear a report on the work of the Voluntary Conferences for the Drafting of Modern Laws Pertaining to Pharmacy, by Chairman F. H. Freericks. (To be printed.)

F. H. FREERICKS: Now, Mr. Chairman, if it is in order, I would move that the draft of these provisions be made a special order of business at the afternoon meeting.

THE CHAIRMAN: It is certainly in order.

F. H. FREERICKS: I would so move.

(Mr. Freerick's motion was duly seconded and carried.)

THE CHAIRMAN: Before we adjourn we have one more topic of business, that is, the nomination and election of officers. The Secretary will read the names of those who were nominated at the close of the Wednesday session.

---

[1] See p. 1007, November issue, also p. 1117, December issue.

THE SECRETARY: Chairman, C. B. Jordan; for Associates, R. A. Kuever, F. W. Nitardy and C. E. Mollet; for Secretary, W. F. Rudd.

W. J. TEETERS: I move that the nominations be closed and that these gentlemen be elected by acclamation.

(The motion was duly seconded and carried.)

THE CHAIRMAN: The meeting stands adjourned until two o'clock this afternoon.

JOINT SESSION OF THE SECTION ON EDUCATION AND LEGISLATION WITH THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES AND THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY.

The Joint Session of the American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy and the Section on Education and Legislation of the American Pharmaceutical Association was called to order by President Rufus A. Lyman, of the American Conference of Pharmaceutical Faculties, Friday, August 31, at 2.00 P.M.

The first order of business was the report of the current meeting of the American Conference of Pharmaceutical Faculties, by Secretary W. J. Teeters, of Iowa. The report follows:

ABSTRACT OF THE MINUTES OF AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES.

The eighteenth annual meeting of the American Conference of Pharmaceutical Faculties was held in Indianapolis, at the Hotel Claypool, August 27 and 28, 1917.

The presidential address of Professor R. A. Lyman was so inclusive in scope and recommendations that all committee recommendations were, by request, to be considered in connection with it. The committee on the President's address consists of W. C. Anderson, of New York, C. E. Caspari, of Missouri, and C. A. Dye, of Ohio.

The following recommendations were approved by the Conference, or such action taken as indicated in this report.

Recommendation No. 1.—That the Conference appoint Dr. Edward Kremers, of the University of Wisconsin, a committee of one, to prepare a brief account of the lives and services of J. O. Schlotterbeck, W. C. Alpers, C. Lewis Diehl, and any others who may have died during the year, and that these accounts be printed in, and be considered a part of the records of the proceedings of the 18th meeting of the Conference, and that the Secretary of the Conference be instructed to notify the respective families of the action which has been taken. Adopted.

Recommendation No. 2.—That the Conference instruct the Secretary to take the proper steps before the next annual meeting in order that Article 1, of the Constitution, may be changed to read, "This body shall be known as the American Association of Schools of Pharmacy," and that the constitution and by-laws be modified in conformity with this change. Rejected.

Recommendation No. 3.—That the recommendation of the Executive Committee, with reference to committees, as indicated on pages 211 and 212, of the Seventeenth Proceedings, be considered not final, and that the following constitute the permanent standing committees of the Conference:

No. 1. Committee on Higher Educational Standards.
No. 2. Committee on Faculties (Classification and Teaching Staff).
No. 3. Committee on Curriculum and Teaching Methods.
No. 4. Committee on Activities of Students and Alumni.
No. 5. Committee on Uniform College Bulletin.
No. 6. Committee on Relations of Pharmacy Schools and Other Professional Schools.
No. 7. Committee on Relations of the Colleges with the Boards.
No. 8. Committee on Joint Examinatipn Questions.
No. 9. Committee on Research.

Recommendation No. 4.—That a four-year high school requirement become binding upon schools of the Conference, September 1, 1920.

This was amended by striking out September 1920, and substituting September 1, 1923, and adopted as amended.

Recommendation No. 5.—That it be the sense of the Conference that Mr. Fairchild could render the greatest service to pharmacy by offering the scholarship to a graduate pharmacy student, in order that he might pursue some research problem for one full school year, in the school of his choice; and further, that this scholarship be awarded on the basis of the applicant's scholastic training, his standing as an undergraduate pharmaceutical student and upon his fitness to do research. Approved and referred to joint session.

Recommendation No. 6.—That the University of Santo Tomas de Manila be asked to designate someone in this country to act as her official representative at the Conference meetings, in order that we may feel the personal touch of that worthy institution, and that that institution in return may feel in a more direct way the inspiration which comes to an institution as a result of contact with the Conference.

Recommendation No. 7.—That the Secretary of the Conference be instructed to write a letter, in the kindliest terms, but in a language which cannot be misunderstood, calling attention to what membership in the Conference means, pointing out where certain members have been negligent, and mail such letter to the Dean or Chief Executive Officer of each one of the departments, schools or colleges of pharmacy, and also to the President of each institution of which these pharmacy schools are a part.

Recommendation No. 8.—That the Executive Committee be instructed to invite some educator of prominence, who is in sympathy with pharmaceutical ideas, amenable, to meet with and address the Conference upon some problem relative to pharmaceutical education. This was referred to the Executive Committee, with instructions to secure some noted educator for an address each year when possible to do so.

Recommendation No. 9.—That the Executive Committee be instructed to study the matter of organization of colleges of pharmacy in the various Conference schools, and wherever it is thought desirable on the part of the school concerned, to offer any suggestions and help which the Conference has at its command.

Recommendation No. 10.—That the Executive Committee be instructed to investigate the organization of schools, to determine if there are cases where two schools are paying but one membership fee and the same men are representing two schools maintaining different requirements, and that the Executive Committee report at the next annual meeting.

Recommendation No. 11.—That the Executive Committee be instructed to notify a certain Conference school (the name of which the President will give in executive session) that the placing of traveling representatives upon the road is not in keeping with the spirit of the Conference, and that such action will not be tolerated and that an explanation of this college's action must be presented at the next annual meeting. The recommendation was referred to the Executive Committee, with instruction to formulate a rule covering this matter, for later submission to the Conference.

Recommendation No. 12.—That the Executive Committee be directed to present this matter to the Carnegie Foundation, and if this Foundation refuses to take it up, to discover some other method of investigating and classifying so as to accomplish a similar result and to report at the next annual meeting.

Recommendation No. 13.—That your Committee on Relations of Colleges with Boards be instructed to express the above view as the sentiment of the Conference, and that this Committee, in conjunction with the proper committee of the Boards, be requested to devise or discover a plan which can be developed, that will render justice to all, and that progress in the matter be reported as early as possible. This was disposed of by a motion that a committee of the Conference, in conjunction with the proper committee of the Boards be requested to devise a plan that will render justice to all concerned in the matter of apprenticeship.

Recommendation No. 14.—That the Committee on Activities of Students and Alumni be directed to devise a plan for establishing an honorary scholarship fraternity in pharmacy and report the same at the next annual meeting. Approved.

Recommendation No. 15.—That it be the sense of the Conference that for the study of pharmacy we should require one year of college work after September 1, 1925, and two years of college work after September 1, 1930, and that this declaration be given wide circulation through the pharmaceutical and lay press and that a special notice of such action be sent to the president of each American university holding membership in the Conference.

Action on this subject was postponed until next year.

The officers elected for the coming year were as follows: *President,* Henry Kraemer, Ann Arbor; *Vice-President,* Charles E. Caspari, St. Louis; *Secretary and Treasurer,* T. J. Bradley, Boston; *Chairman Executive Committee,* J. A. Koch, Pittsburgh; *Members Executive Committee,* R. A. Lyman, Lincoln, and F. J. Wulling, Minneapolis; *Syllabus Committee,* A. Bolenbaugh, Richmond.

Respectfully submitted,

WILBER J. TEETERS, *Secretary.*

THE CHAIRMAN: The report is open for discussion and corrections, if there are any to be made. I think the report is correct.

The next order of business was the report on the Fairchild Scholarship which follows:

TO THE SECTION ON EDUCATION AND LEGISLATION OF THE A. PH. A., the AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES, AND THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY:

In the report of last year on the Fairchild Scholarship, the President of the American Pharmaceutical Association was named Chairman of that Committee and the other members are: the president of the American Conference of Pharmaceutical Faculties, the president of the National Association of Boards of Pharmacy, and the editor of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, thus while the individual members of the Committee may change, it is really a permanent committee.

After the last annual meeting, President Frederick J. Wulling suggested to the Committee that the editor of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION be named Chairman; this suggestion was favorably acted upon by all the members, with the exception of the editor, who did not vote. The latter consented to accept, provided it met the approval of Mr. Fairchild. President Wulling wrote to Mr. Fairchild and his response was favorable.

The requirements of the candidates for the Fairchild Scholarship were named as follows: That the candidate shall be a graduate from a four-year high school course, that he have four years' drug store experience and pass an examination on questions to be prepared by a committee appointed by the Fairchild Scholarship Committee and that the examination be conducted under the supervision of the dean of a school of pharmacy belonging to the American Conference of Pharmaceutical Faculties, the president of the State Board of the State in which the examination was held or these officials might select representatives for the conduct of the examinations. The successful candidates shall have a right to choose the school in which he or she desires to matriculate.

The examination questions relate to elementary chemistry, elementary materia medica, practical pharmacy and prescription reading, and elementary business knowledge. The general scheme was outlined largely according to the rules of the British Fairchild Scholarship.

The Committee decided that the requirements for four-year drug store experience should be changed to two years of such experience and the Chairman was instructed to ask Mr. Fairchild whether he would be willing to have such change made. He answered as follows:

"Yes! it is quite agreeable to me to have the four years' drug store experience changed to two years; but with respect to any section of the plan of your committee please do not regard any wishes of mine as against the majority of the committee.

"I am very glad that it looks now as if the work might progress so that the Scholarship can be made available this year."

The letter is given in full so that Mr. Fairchild's coöperative spirit and interest may be shown evidencing that he desires to aid in every way possible and in accord with the interested bodies.

The Committee therefore proceeded with the preparation of examination questions through the appointment of a Special Committee consisting of Prof. Henry Kraemer, Prof. Wilber J. Teeters, Mr. H. C. Christensen and Mr. John Culley. The questions were prepared and the day set for the examination of candidates, namely, June 25, 1917. While a number of candidates promised to appear, only one actually came up for examination. It should be stated that the time was rather inopportune, the announcement was too late for most school catalogs and during vacation season. In order to make the Scholarship available, if possible, this year, and impossible to award the Scholarship without competition, an adjourned meeting for holding examinations has been called for September 26. It is to be hoped that the Conference and the National Association of Boards of Pharmacy will make it possible to have a number of candidates at that time. We are certain that your interest and appreciation of Mr. Fairchild's gift will make the award possible.

As indicated, the plan of award was based on that of the British Fairchild Scholarship, but it is clearly evident if this does not seem practicable in this country, Mr. Fairchild will gladly consent to changes that may be deemed necessary.

The following suggestions have been made:

That the Scholarship be awarded to one who has finished one year in a school of pharmacy belonging to the Conference and successfully passed the prescribed examination.

That instead of proficiency in the subjects now required, the qualifying subjects should be English, arithmetic, physics, physiology, high school chemistry, and botany.

That the qualification be determined, not by the knowledge that the candidate has graduated from a high school course, but by actual test in the subjects regardless of the preliminary training and education.

That the Scholarship be awarded by competitive examination of senior students for post-graduate work.

That instead of the Scholarship being awarded by competition to a candidate regardless of locality in the United States, for the purpose of the award the United States be divided into four sections, the Northeast, the Southeast, the Northwest and the Southwest, and that the award be made the first year to a student of one section, next year to one of another section, until each section has had the opportunity for the Scholarship, and continue the award in this rotation.

It will, of course, be remembered that Mr. Fairchild offered the Scholarship *and we should as nearly as possible conform to his ideas when he first proposed his generous gift.* However, from the correspondence with Mr. Fairchild, it will readily be discerned that he desires to serve the best interests of pharmacy. Your consideration of the matter will therefore be appreciated by the Committee and your report awaited with interest. This year we hope that you will aid in making it possible to award the Scholarship under the rules formulated.

Sincerely,

E. G. EBERLE, *Chairman.*

THE CHAIRMAN: The Chair is not certain as to the method of procedure. The report of the Conference of the meeting is before us. One recommendation was made by the President with reference to the Fairchild Scholarship, and now we are discussing this recommendation with the report of Mr. Eberle, Chairman of the Committee on the Fairchild Scholarship.

E. G. EBERLE: Nearly all of the letters I have received are favorable to the plan that the Scholarship be awarded to a second-year student instead of one who has not attended a school of pharmacy.

THE CHAIRMAN: A motion is in order to receive and refer the report of the Secretary of the Conference for Publication.

C. A. DYE: I make such a motion.

(The motion was seconded, put to a vote and carried.)

THE CHAIRMAN: Now, we will take up this special item for consideration.

ROBERT P. FISCHELIS: I understood the recommendation of the Conference of the Faculties was to refer this matter to Mr. Eberle, and that he was to make a recommendation.

E. G. EBERLE: It should be understood that the Fairchild Scholarship Committee is really not a committee of any one of these bodies, but constituted of members belonging to these organizations. Whatever action is taken can only be recommendatory, if you feel so disposed, and I will be glad to confer with Mr. Fairchild.

THE CHAIRMAN: The Conference approved the President's recommendation, which simply asks the Conference that this Scholarship should be awarded to a senior student of a college of pharmacy of the Conference; that it should be awarded upon the basis of the applicant's scholastic training in the course of work required while in college and his fitness to do research.

R. P. Fischelis moved the adoption of the President's recommendation.

FREDERICK J. WULLING: Does the recommendation state the second year, or the senior year?

THE CHAIRMAN: The senior student.

FREDERICK J. WULLING: That would be the graduating year.

THE CHAIRMAN: The motion was to the effect that this Joint Session go on record as favoring the award of the scholarship to senior students; the Joint Session goes on record as favorable to the report of the President of the Conference.

Motion seconded.

ABSTRACT OF DISCUSSION.

CASWELL A. MAYO: This Scholarship was founded at my request, and after long consultation with Mr. Fairchild. When I conferred with him on the subject, we hit upon the expediency of having the Scholarship open to everyone. While he is perfectly willing to abide by any suggestions made, I always accentuated the fact that such Scholarship might attract a more desirable class of men to pharmacy than formerly. That was the idea in all our discussions. The idea is that there are a good many young men whose plans are indefinite, who might by the offer of a scholarship be induced to enter pharmacy. That is the thought I had at least, and one in which Mr. Fairchild decidedly agreed, of offering the Scholarship to a young man who was not already a student of a school of pharmacy.

There may be good and substantial and sufficient reasons to change. The difficulty we have had this year with the Scholarship indicates that there may be some reasons for changing the method of procedure.

THE CHAIRMAN: It seems to be evident from Mr. Fairchild's letter that he is amenable to suggestions, and it is just a matter of how we will gain the most for pharmacy in the awarding of this Scholarship.

C. A. MAYO: That has been his attitude from the beginning.

F. E. STEWART: I have not heard any reference made to the recommendations made by the Conference that this Scholarship should be awarded to one who has already graduated from our two-year course.

THE CHAIRMAN: The motion is now before the house, that the Joint Body approve the recommendations of the President of the Conference. We are now talking to that motion.

E. F. KELLY: How would you make the examinations fit the curriculum of schools requiring more than two years for graduation?

EDWARD KREMERS: I believe that young men will be attracted to pharmacy, not so much from the fact that when they enter pharmacy they have no tuition fee to pay for the first year, as from the possibilities that develop in the future. If we can advance pharmacy, I am sure the better young men and women of this country will want to enter pharmacy.

Just a word with regard to the wording of the resolution. It seems to me it is a trifle unfortunate to say it is to be given to a senior student. That is a subject of dual interpretation.

It may be given to junior students, after completing the first-year course whereby they become seniors for the next year. If we want to stimulate graduate work, then we ought to have that specified. May I make an amendment that graduate be substituted?

R. P. FISCHELIS: I accept the amendment.

THE CHAIRMAN: The maker of the motion accepts the amendment.

FREDERICK J. WULLING: I understood it was the desire of the donor of the Scholarship that it should go to a young man who has not yet entered school. If it is deemed admissible that the Scholarship be awarded to a graduate, that, I think, would be a very happy solution of our difficulty, provided it meets with the approval of Mr. Fairchild. I have thought right along that we should do what Mr. Fairchild wants us to do in this matter.

CHARLES E. CASPARI: In view of Mr. Fairchild's statement that he preferred to have the Committee settle this rather than consult his wishes in the matter, and in fact, there is only one scholarship, there seems to me no doubt it would do far more good to award it to a graduate in pharmacy rather than to a man not a student in undergraduate work. If we had one scholarship for each college, or more, I would say, let it go to one who has not entered a school, but since we have only one, I think the greater amount of good would be gained by granting the same to some desirable student deserving of it; if any student, a graduate student, rather than an undergraduate. As a member of the Committee on the President's address, it is the recommendation I would make.

CASWELL A. MAYO: I know Mr. Fairchild's view sufficiently to know that he only wishes the Scholarship to be administered in the very best way. I might relate an experience that I personally had, but I do not want it in any way to influence the members. Before entering a school of pharmacy I was a clerk in a drug store at a small salary and was questioning myself as to whether I would remain in pharmacy, when I was awarded the Peter Williamson Scholarship. With this deep feeling of indebtedness to that donor, I took the matter of a like scholarship up with Mr. Fairchild.

H. C. CHRISTENSEN: Inasmuch as the National Association of Boards of Pharmacy took action on this matter only in a recommendatory way, and as I have not made a report on our meeting, I would like to state that the Association went on record as recommending that the Scholarship be awarded on the basis of the second-year work. We did not hear anything of the graduation feature, and it seemed from our previous experience that the idea of awarding the Scholarship simply on high school graduation, that there was not anything to base the competitive examination on.

I agree with what has been said here entirely, that the basis should be graduation. Then there would be something on which to base competitive examination for scholarship, and I believe it would have a tendency to bring about competitive work, and make these applicants look forward to progress in pharmacy. I heartily agree with this proposition.

FREDERICK J. WULLING: Whatever action we take is also the action of the Board, as well as the Conference and this Section of the A. Ph. A., that the candidates for the Scholarship should be graduates of Conference colleges.

THE CHAIRMAN: Yes, it is so stated. The only change is that in connection with senior and graduate. I may say that the scholarship is awarded by the Fairchild Committee, and this action is simply recommendatory. This Committee and Mr. Fairchild are seeking light as to the best way of awarding this Scholarship to do the most for American pharmacy, so this is simply a discussion of the proposition by these three bodies, and then the matter will be considered by the Committee and Mr. Fairchild.

All those in favor of the motion will signify by saying "Aye." Contrary "No." It is carried, and is a unanimous vote.

The next matter on the program will be the report of the Fourteenth Annual Meeting of the National Association of Boards of Pharmacy, by Mr. Christensen, of Chicago. This follows:

REPORT OF THE FOURTEENTH ANNUAL MEETING OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY.

The Fourteenth Annual Convention of the National Association of Boards of Pharmacy was called to order in the Assembly Hall of the Claypool Hotel, Indianapolis, Ind., by President Lawrence C. Lewis, at 10.15 A.M., Monday, August 27, 1917.

Roll-call showed twenty-seven states represented as follows: Alabama, Arkansas, Connecticut, Florida, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Mississippi, Missouri, Nebraska, New Jersey, New York, North Dakota, Oklahoma, Pennsylvania, Tennessee, Texas, Utah, Vermont, Virginia, Wisconsin. Total number of delegates and associate delegates present, fifty-two. The address of welcome by Burton Cassaday, of the Indiana Board of Pharmacy, was responded to by John Culley, of the Utah board.

President Lewis invited D. W. Ramsaur, of Florida, to take the chair, and then proceeded with his presidential address. After calling attention to general conditions in pharmacy prevailing throughout the country on account of the war, he announced with much feeling the death of A. C. Wilson, of Iowa, late member of the Executive Committee; he also reported the death, during the past year, of C. Lewis Diehl, Wm. C. Alpers, Martin I. Wilbert and others, who had labored hard in the past to place pharmacy on a higher plane.

He then cited some of the activities of the Committee of the A. Ph. A. and the boards in the matter of the Fairchild Scholarship and said he hoped that during the next year a more practical plan would be adopted with regard to the awarding of this Scholarship. It was suggested later in the meeting that the Scholarship be awarded for the last year's work in a school of pharmacy instead of the first as this year. This it was thought would not only be the means of bringing more candidates to apply for the scholarship, but would also enable the Committee to adopt a more practical plan of award, basing examination on the first year's work in a school of pharmacy as well as high school and practical work.

Other recommendations of the president were as follows:

That the secretary and the chairman of the Executive Committee of the Association be appointed as a Committee on Necrology to draft suitable resolutions, and that the "In Memoriam" page in the Annual Proceedings be continued.

That the dues and reciprocal blank fees remain the same as in the past year, so that the chairman of the Advisory Examination Committee may be enabled to visit as many states during examination periods as possible and furnish such suggestions and information as may lead to continued progress toward higher and more uniform standards for state board examinations.

The Committee on the President's Address not only approved of this, but suggested further that the members of the state boards should visit their neighboring states while holding examinations and thus by personal interview acquaint themselves and study the methods and practices in use.

That a committee of three, consisting of the president, secretary and chairman of the Executive Committee, confer with the Committee on Time and Place of the A. Ph. A. with a view of having our annual convention a week earlier in August. The reason for this was given that it would insure a larger attendance of board of pharmacy members. Most board members are actively engaged in business and many handle school text-books so that it is imperative that they be at their places of business several days before the first of September, so as to have this part of their business in shape for the opening of schools.

That state board members be as liberal as possible in construing the "one year resident" clause in cases of applicants for reciprocity where the applicant complies fully with other requirements of the N. A. B. P. for reciprocity.

That the Association go on record as endorsing the Edmonds Bill, known as H. R. 5531, introduced by Honorable G. W. Edmonds, Philadelphia, and drafted by the National Pharmaceutical Service Association.

That state boards adopt more uniform fees for reciprocal registration in the various states. It was pointed out that fees varied from five to twenty-five dollars. A uniform fee of fifteen dollars was recommended, unless this would conflict with state laws.

In accordance with action previously taken by the Executive Committee, it was recommended that the Secretary be instructed to make application for membership of the N. A. B. P. in the National Drug Trade Conference, and on adoption of the report of the Committee on the President's Address it was so ordered.

From reports made by committees of the Association, it is very evident that the past year has brought forth more good than any previous year since the Association was organized. The report of the chairman of the Advisory Examination Committee showed that as secretary and chairman of this Committee he visited fourteen states during the past year and that in all of these satisfactory progress was being made in examination work; also, four states, Colorado, Nevada, Pennsylvania and South Carolina, were added to the active membership list of the Association during the past year.

The following officers were elected: *President*, W. P. Porterfield, Fargo, N. D.; *First Vice-President*, J. A. Weeks, Ballinger, Texas; *Second Vice-President*, W. R. Jarrett, Oklahoma City; *Third Vice-President*, D. E. Haddon, Alta, Ia; *Secretary*, H. C. Christensen, Chicago; *Treasurer*, Charles H. Skinner, Windsor, Vt.; *Members of the Executive Committee*, John Culley, Odgen, Utah, and H. E. Purdy, Derby, Conn.

H. C. CHRISTENSEN, *Secretary*.

C. E. Mollett moved that the report be received and being seconded was on vote adopted:

CHAIRMAN R. A. LYMAN: President Stone was on the program for an address but he is absent so this finishes the business in which we are concerned as a joint body. I will now call upon Mr. Kuever, who will act as Chairman and finish the program.

CHAIRMAN R. A. KUEVER: We have two papers from the first session on Wednesday, and we will hear those first. They are: "The School of Pharmacy and the Profession," by C. F. Nelson, and "Graduate Instruction in Pharmacy in the United States," by Edward Kremers.

These were read, discussed and referred for publication. (See this issue.)

The next paper was by C. H. LaWall on "A Bad Spell, or Who Mixed the Letters." (See p. 1063, December issue.)

The following papers, owing to the absence of the authors, were read by title and referred for publication:

"Privately Owned Schools and Colleges of Pharmacy," by Edward Spease.

"Are Colleges of Pharmacy Devoting Sufficient Time to Prescription Laboratory Practice?" by A. W. Linton.

"The State Legislature," by W. H. Cousins.

The next order of business was the presentation of the report of the Committee on Drafting of a Model Pharmacy Law by Chairman F. H. Freericks.

(This report with abstract of discussions will be printed in a later issue.)

A motion was made by H. C. Christensen and seconded by C. E. Mollett that a rising vote of thanks be extended to this committee for its faithful work, and this was afterward amended, requesting the incoming President to reappoint the same committee and that it be empowered to continue the work. It was unanimously carried.

Chairman Freericks expressed the hope that the final report would be made at the next annual meeting of the Association.

The meeting of the Section on Education and Legislation was then adjourned.

REPORT OF THE COMMISSION ON PROPRIETARY MEDICINES OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1916–1917.*

TO THE COUNCIL AND MEMBERS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION:

The Commission on Proprietary Medicines submits for your consideration the following report of its activities for the year 1916–1917:

Since its last report the Commission has suffered the loss by death of two of its most valued and useful members, Mr. Martin I. Wilbert, of Washington, D. C., and Mr. Thos. F. Main, of New York City.

MARTIN I. WILBERT—THOMAS F. MAIN.

Mr. Wilbert was one of the best-known pharmacists in the United States, and one of the most conscientious members and ablest workers of the American Pharmaceutical Association.

He became a member of the Commission at the time of its creation, and during his remaining life gave close attention to the problems incident to the manufacture, advertising, sale and use of package medicines of a proprietary character; and worked faithfully with his fellow-members of the Commission to formulate and secure the adoption of principles designed to safeguard the public interest and to place the proprietary medicine industry upon a proper and acceptable basis.

He was an honest, earnest and continuous student of the reciprocal relations between pharmacy, medicine and the public, and devoted the utmost energies of his too short life to work for the common good.

Mr. Main was also one of the original members of the Commission and until the day of his death was constant in his efforts to contribute to the success of its work.

Mr. Main's many years of experience as manufacturer, wholesaler and retailer fitted him peculiarly for service on the Commission and to render unbiased judgments upon questions affecting the several divisions of the drug trade.

To all who knew him he was the embodiment of honor and integrity, and one whose broad-mindedness and gentleness of manner endeared him to those with whom he was brought in contact.

The surviving members of the Commission desire here to place on record their sense of loss and profound sorrow occasioned by the death of their two departed colleagues, whose virtues and eminent services they will ever hold in faithful remembrance.

Action of Associated Advertising Clubs with Respect to Medical Advertising.—By invitation, the Chairman of the Commission on Proprietary Medicines attended the mid-year conference of the National Vigilance Committee of the Associated Advertising Clubs of the World, held at Indianapolis, Ind., March 5, 1917, and presented a paper dealing with the general subject of medical advertising and with the work of this Commission.

Following a general discussion of the paper and of the general subject of medical advertising, the Vigilance Committee appointed a sub-committee to formulate standards for proprietary package medicines advertised to the general public, and invited the members of the Commission to meet with and take part in the deliberations of such sub-committee.

The Sub-Committee thus created met at the LaSalle Hotel, Chicago, March 27th, at which meeting the Commission on Proprietary Medicines was represented by the Chairman, who was the only member able to be present.

After a discussion covering almost an entire day, the Sub-Committee formulated a list of principles to be regarded as standards for proprietary package

* Presented at the Indianapolis meeting, 1917.

medicines advertised to the general public, and adopted a code of rules and regulations for the investigation of such medicines.

The report of this Sub-Committee was at a later date presented to the National Vigilance Committee of the Associated Advertising Clubs at its annual convention held in the city of St. Louis, June 4, 5 and 6, 1917, when the principles and regulations were completed and approved, and now constitute the code by which the National Vigilance Committee will judge the character of package medicines advertised in so far as it shall be called upon to pass judgment upon the same.

The standards and regulations as promulgated by the National Vigilance Committee are as follows:

STANDARDS FOR MEDICAL ADVERTISING.

There is a legitimate field for the advertising of ready-made package remedies intended for the domestic treatment of common ailments, providing the following requirements are met:

(1) *Appropriate Use.*—The advertised medicine must be appropriate for use in the particular affections for which it is recommended and must not unfavorably affect the course of the disease for which it is recommended.

(2) *Prescription Fakes, Concealment of Proprietary Character.*—The preparation must not be named or advertised in such a way as to conceal its proprietary character and lead the purchaser to believe that it is a simple chemical or vegetable drug ordinarily purchasable in small quantities instead of a proprietary mixture or substance.

(3) *Methods of Marketing.*—Ordinarily the preparation should be one which is regularly offered to the public through the usual trade channels, *i. e.*, through regular wholesale and retail dealers in ready-made medicines, and thus subject to inspection by the authorities charged with the enforcement of state food and drug laws.

(4) *Alcohol Content.*—If the preparation contains alcohol, it must be sufficiently medicated to prevent its use as an intoxicating beverage, and in addition to this requirement, the proportion of alcohol present must not be greater than is properly necessary to hold in solution in permanently active condition the essential constituents of the preparation, and to protect the preparation against freezing, fermentation, or other deleterious change.

(5) *Content of Habit-Forming Narcotic Drugs.*—If the preparation is one which is capable of being used internally, whether recommended for internal use or not, it must not contain cocaine, nor shall it contain opium or any of its alkaloids or their derivatives in greater proportion than those specified in Section Six of the Federal Law, commonly known as the Harrison Act, and it shall also contain other active drugs in such proportion that the use of the preparation will not be likely to create a drug habit, nor satisfy such a habit when previously existing.

(6) *Remedies for Children's Use.*—If intended for administration to infants or children, the preparation must not contain cocaine, or opium or its alkaloids, or their derivatives in any proportion whatever.

(7) *Activity of the Preparation, Cautions against Misuse.*—The preparation must be of such character that it will not be liable to endanger life or health when used in accordance with the accompanying instructions, and if the preparation is one which is liable to occasion injury when improperly used or when used to excess, the accompanying label and literature must bear instructions tending to guard against such improper or excessive use.

(8) *Immoral or Illegal Purposes.*—The preparation must not be intended for use as an abortifacient nor for use for any other immoral or illegal purpose, nor must it be advertised or recommended either directly or indirectly as an abortifacient or for any immoral or illegal purposes.

(9) *Incurable and Contagious Diseases.*—The preparation must not be advertised or recommended, directly or by inference, as a cure for diseases or conditions which are generally recognized as incurable by the simple administration of drugs, or for the cure of contagious diseases or those sufficiently acute to require treatment by a qualified medical attendant.

(10) *Conformity to the Federal Food and Drugs Act.*—Neither the label on the package nor any of the accompanying literature shall bear or contain any statement in conflict with the misbranding provisions of the Federal Food and Drugs Act.

(11) *Advertising Not Accompanying the Package.*—Advertising not accompanying the package shall conform substantially to the statements on the label, carton, or in the acccompanying circulars as to the origin, composition or character of the preparation, or concerning its curative or remedial value.

OUTLINE OF A PLAN FOR THE INVESTIGATION OF PACKAGE MEDICINE ADVERTISING.

The National Vigilance Committee approves the following plan for the investigation of the advertising of proprietary package medicines to the public:

(1) The requirements for proprietary package remedies intended for direct sale to the general public approved by the Commission on Proprietary Medicines of the American Pharmaceutical Association, as modified by the Vigilance Committee, are hereby adopted as the requirements of this committee in so far as they may be applicable to the work of the committee, and in so far as they are consistent with the regulations herein contained *or which may hereafter be adopted by the Vigilance Committee.*

(2) In considering the claims of curative or medicinal value made for a proprietary medicine, the Vigilance Committee will not undertake to decide between the views of rival schools of medicine, or between groups of physicians which maintain antagonistic opinions as to the medicinal value of the important constituents of any such proprietary medicine.

(3) In view of the difficulty of demonstrating the curative value of drugs by absolute proof and of the wide difference of opinion maintained by the various schools of medicine respecting the curative or medicinal value of numerous drugs, the Vigilance Committee will confine itself in the main, to a consideration of the honesty and good faith of the claims which are made in the advertisements to be considered.

(4) Evidence offered to justify claims of remedial value must be of substantial character, or of such a character as would ordinarily appeal to men of good judgment and not personally interested in the results of the decision.

(5) Evidence as to the medicinal value of a preparation or of the drugs used therein shall be of the same kind and quality as would ordinarily be considered sufficient to justify the good faith of a physician in using the same drugs in the same affections as those for which the preparation is advertised.

(6) As admissible evidence within the meaning of Regulations 4 and 5, the Vigilance Committee will consider any or all of the following:

a. Either oral or sworn written statements as to the use by legally qualified practicing physicians of the drugs contained in such preparation in the treatment of the affections for which the preparation is advertised.

b. Either oral or sworn written statements of the maker or advertiser as to the truthfulness and good faith of the claims made for an advertised preparation, or of the names and addresses of persons who have used such preparation with satisfactory results.

c. Affidavits of persons who have used the advertised preparation for the purpose for which it is advertised; but every such affidavit shall be signed by at least one disinterested witness in addition to the officer before whom the affidavit is made, which witness shall also certify that the contents of the affidavit were read in the hearing of the affiant and that the latter assented.

d. The statements of medical journals having general circulation among medical practitioners representing any school of medicine as to the medical properties and uses of any preparation or of any drug or medicinal substance used as an ingredient of such preparation.

e. The statements of text-books or manuals of materia medica, therapeutics or practice of medicine, or other works of reference in common use by legally qualified physicians of any so-called school of medicine, as to the medicinal uses or value of the drugs contained in a preparation.

f. Any other testimony which the Vigilance Committee may deem competent evidence as to the medicinal value of the preparation, or as to the truthfulness and good faith of the advertised claims made therefor.

Any information as to the composition of a proprietary medicine which may be communicated to the Committee will be preserved in confidence by the Committee, if so requested by the party making the communication, provided such request is made before the information is submitted.

(7) In all matters of dispute between the advertiser and Vigilance Committee, the burden of proof shall be upon the advertiser to establish the truth of his contention to the satisfaction of the Committee.

(8) Within the discretion of the Vigilance Committee a written answer to any objection which may be made to any advertisement may be accepted, or the advertiser may be requested to appear in person or by representative for the presentation of evidence or argument.

(9) Copies of the requirements for advertised proprietary medicines adopted by the Vigilance Committee and of these regulations shall be furnished on request to any advertiser or proprietor of an advertised package remedy, and to any newspaper advertising association or other agency of publicity.

The importance of this action of the National Vigilance Committee can hardly be over-estimated. The Associated Advertising Clubs is probably the strongest existing influence connected with the advertising business, and its ability to investigate and expose fraudulent advertising schemes is constantly increasing.

The members of the National Vigilance Committee are practical men, with judgments matured by many years of experience and who are thoroughly imbued with the doctrine that truth in advertising is essential both to those who have wares to sell and to those who deal in advertising.

We may expect with confidence that the efforts of the Vigilance Committee will result in the gradual elimination of the advertisement of fraudulent or valueless package medicines from the columns of the public press and that they will also promote the more truthful advertisement of those which, though possessed of merit, are frequently extravagantly extolled.

Effect of the Harrison Act on the Sale of Package Remedies Containing Habit-Forming Narcotic Drugs.—As a part of its work during the past year the Commission has made an investigation of the effect of the Federal Anti-Narcotic Act, commonly known as the Harrison Law, upon the sale of habit-forming narcotic drugs and of package medicines containing them. Letters were addressed to members of the wholesale drug trade, distributed generally over the United States, asking for information as follows:

1. The extent of any observed increase or decrease in the sale of drugs covered by the Harrison Law, since its enactment.

2. The extent of any observed increase or decrease in the sale of non-proprietary preparations, such as paregoric, Godfrey's cordial, and Bateman's drops, exempted by Section Six of the Harrison Law.

3. The extent of any observed increase or decrease in the sale of proprietary package remedies containing the drugs covered by the Harrison law and exempted by Section Six of that law.

Replies were received from 102 wholesale drug firms, located in 37 states, from which the following data have been compiled:

The replies to Query No. 1 indicate conclusively that since the enactment of the Harrison law there has been a large decrease in the sale of habit-forming narcotic drugs covered by that act for the sale of which an official order blank or physician's prescription is required, the average of all the decreases reported in figures amounting to no less than 66.3 percent.

The answers to Query No. 2 indicate that there has been a very considerable increase in the sale of *non-proprietary* articles containing opium, such as paregoric and Bateman's drops, amounting to an average of 118 percent for the firms which give definite figures for their increased

sales. These increased sales, however, fall far short of replacing the decreased sales reported for the drugs included in Query No. 1.*

The answers to the query respecting increased or decreased sales of *proprietary medicines* containing narcotic drugs were agreeably surprising to the members of the Proprietary Commission. It had been assumed as a matter of course that the inability of drug addicts to procure their accustomed supplies of opium or its alkaloids would prompt them to purchase package remedies containing these drugs among their constituents. Such, however, does not seem to have been the case, as indicated by the reports of wholesale druggists.

Fifty wholesale druggists report that they have noted little or no change in the volume of sales of proprietary preparations containing narcotics, notwithstanding the very general increase in the volume of business in other drug lines.

Twenty-six firms report *decreases* in the sale of such preparations, which they estimate at figures ranging from 10 to 80 percent.

Thirteen firms, without naming any percentage of reduction, report that their sales of such proprietary articles have decreased or largely decreased.

Three report that the sale of such articles in the districts in which they mainly do business is practically non-existent.

Several firms report that they do not handle such preparations, and several other firms do not make any answer to the query.

Eight firms report some *increase* in the sale of proprietaries of this class, generally stated to be slight, or very slight, but in two cases estimated at 25 percent. These reported increases appear to have been in connection with only two preparations, which are said to include other narcotic drugs, such as alcohol or ether in addition to their opium content. These particular preparations will be again referred to in a later section of this report.

The firms reporting decreases in the sale of proprietary articles containing habit-forming drugs offer one or more of the following reasons in explanation:

1. That the general notoriety given to the subject of habit-forming drugs by the enactment of the Harrison Law has tended to make purchasers wary of preparations containing such drugs, and has also prompted retail pharmacists to advise their customers against the purchase of such preparations.

2. That several of the more objectionable preparations of this class, *i. e.*, those which contain narcotics in sufficient proportion to make their use desirable by addicts, have been entirely withdrawn from the market by their manufacturers.

3. That the quantities of habit-forming drugs contained in certain other proprietaries have been reduced to such an extent that their narcotic effect is negligible in comparison to the effects of the associated drugs, so that habitués not being able to obtain the desired effect from the combinations do not purchase them.

From the above it would appear that the sale of proprietary medicines containing habit-forming drugs does not at the present time constitute any serious menace to the continued efficiency of the Harrison Law, and that if any further federal legislation is needed with respect to habit-forming narcotic drugs it should rather be made to apply to the official preparations of the Pharmacopoeia and National Formulary, than to the usual non-official preparations of the market.

The Origin and Introduction of Package Remedies.—Acting on a suggestion of our lamented colleague, Mr. M. I. Wilbert, the Commission has this year made a preliminary study of the origin and introduction of the package remedies commonly known as "patent medicines."

It was Mr. Wilbert's belief that, contrary to general opinion, the drug trade has had but a minor part in the introduction of patent medicines to the public

* The answers to these two queries are dealt with more in detail in a separate paper presented by the Chairman to the National Drug Trade Conference at its last meeting in Washington, held in May of the present year.

attention, and that the major responsibility for the introduction of such remedies rests with the medical profession, which opinion seems to be in some measure borne out by the result of our investigations.

In accordance with Mr. Wilbert's suggestions, letters were addressed to about 250 makers of proprietary medicines scattered quite generally over the United States, presenting a series of questions concerning the points upon which information was desired. Each letter was accompanied by a stamped return envelope, and the persons to whom the questions were addressed were advised that information furnished would be used in a statistical way only, and that if given as "confidential" it would be so preserved. About 100 manufacturers responded with more or less completeness to our questions, and upon these responses, supplemented by personal correspondence when the information first given was not satisfactory or sufficiently definite, the following study has been based.

On a study of the letters it was found that many of the answers related to toilet articles or preparations which could not properly be regarded as remedial in character, and these, together with other answers which seemed to be evasive or indefinite in their terms, were rejected, after first attempting to secure more satisfactory information by further correspondence.

After these various eliminations were made there remained answers from 79 makers of proprietary remedies giving information respecting 317 package preparations, which seemed to be of such definiteness as to entitle them to serious consideration, and from a tabulation of these answers the following data have been compiled:

Of the 317 preparations reported upon, 187, or 58.99 percent, are reported as originating in the form of physicians' prescriptions, the information being accompanied by the names and addresses of the physicians whose prescriptions were used as the foundation of the medicines named.

Of the 187 remedies reported as originating as physicians' prescriptions, 97, or 30.59 percent of the whole number of preparations studied, were introduced and first sold in package form by the physicians who claimed to be their originators.

The remainder of the 317 remedies are reported to have originated in the following ways:

The formulas of 28 package remedies are admitted to have been adopted or "adapted" from standard medical or pharmaceutical literature, such as the Pharmacopoeia of the United States, the French Codex, the British Pharmaceutical Codex or the National Formulary.

The formulas of 73 preparations are claimed to have been devised by chemists or pharmaceutical chemists, some of whom admit their indebtedness to physicians' prescriptions or to medical or pharmaceutical literature, while others claim entire credit for the creation of the formulas reported upon.

The formulas of the remaining 29 preparations are reported as having come to the manufacturers in the form of recipes which have been long in the possession of certain persons or families, and highly prized because of their real or supposed efficacy in the treatment of certain ailments. In such cases all traces of the real origin of the formulas have usually been lost or forgotten. Some preparations of this class have been continuously on the market for periods ranging from fifty to eighty years or more.

Of the preceding it will be observed that there are three classes of cases in which the formulas are not attributed directly to physicians' prescriptions, namely, those adopted or adapted from medical or pharmaceutical literature, those claimed to have been devised by pharmacists or pharmaceutical chemists, and those the origin of which is unknown, or which came into the hands of their present

proprietors in the form of what are commonly known to the trade as "family recipes."

Persons familiar with the manner in which formulas are introduced into medical and pharmaceutical literature, and with the manner in which so-called family recipes originate, will recognize that they are but a very short distance removed from physicians' prescriptions, and also that those claimed to be devised by pharmaceutical chemists are very largely based upon physicians' prescriptions, either directly or upon printed formulas appearing in medical literature.

In studying the answers one is struck by the considerable number of names eminent in American Medicine as authors of text-books on materia medica or practice who have been responsible either openly or under cover, for the introduction of remedies of this class. One expedient sometimes resorted to in naming such medicines has been to call them by the first name of the originating physician. For example, if the physician's name was Dr. X. Y., the preparations were put on the market as Dr. X.'s remedies.

In some instances the physician's prescription has apparently been used without any knowledge or connivance on the part of the physician himself, but in numerous other cases the physician has given permission for the manufacture and sale of the preparation as a package remedy in return for a cash bonus or for a royalty on the medicine sold. In many cases where royalties were at first paid they have later been extinguished by the payment of a lump sum in cash or by the acceptance of a certain amount of stock in the manufacturing concern.

Another interesting fact brought out from the study of the letters is that of late years, and especially since the passage of the Food and Drugs Act of 1906, it has become increasingly common for manufacturers of package remedies to submit their formulas and literature to one or more physicians or pharmaceutical chemists for study and revision, and to make changes in the formula or the literature in accordance with the recommendations received.

An illustration of the adage that "Doctors will differ" is presented in one case where a manufacturer, desirous of availing himself of the best of authority, submitted the formula of his preparation and the accompanying literature to a committee of three physicians representing three different medical colleges. The formula was approved by all three of the physician experts who, however, recommended some changes in the claims made in the literature. These suggestions were adopted and incorporated on the label and in the literature and, about a year later, to his surprise, the proprietor was cited under the Food and Drugs Act for issuing a misbranded preparation, *i. e.*, for making claims in the literature which, in the opinion of the authorities at Washington, were false and misleading. The puzzled manufacturer inquires, "How in —— can a man know what to do when he gets the opinion of the best medical experts on his labels and is then arrested for selling a fraudulent medicine?"

One can understand the puzzlement of this manufacturer when he reads the general medical literature pertaining to the various articles of the materia medica. There are very few items of the materia medica that have not been extolled by therapeutists in medical journals or in the text-books which they have written for their students in far more laudatory terms than the average maker of a package remedy would dare claim for his preparation.

A question which suggests itself in this connection is, to what extent is the manufacturer of a proprietary medicine justified in relying upon the statements found in books generally regarded as standard authorities on materia medica and therapeutics when he composes his claims for his preparation? Should he be permitted to recommend his preparations with the same liberal terms of praise that the professor in a medical college is permitted to bestow upon the drugs used as ingredients of such preparations in his lectures to his students, or the writer in a medical journal or the author of a text-book addressed to his colleagues in the profession; or is he to be held to a higher and stricter accountability for his claims of therapeutic value?

Cases of Drug Addiction or Alcohol Habit, or of Injuries Resulting from the Use of Patent Medicines.—The resolutions providing for the creation of the Commission on Proprietary Medicines make it a part of the duty of the Commission to inquire whether and to what extent package medicines contain alcohol or habit-forming narcotic drugs in sufficient proportions to render them likely to create an alcohol or drug habit, or render them liable to cause injury in the hands of the laity.

As an introduction to this particular feature of its work, the Commission early in the year requested the editors of journals addressed to the drug trade within the United States to print the following announcement:

"To Members of the Drug Trade."

"The Commission on Proprietary Medicines of the American Pharmaceutical Association is desirous of obtaining reliable information respecting injuries alleged to have been caused by the use of proprietary medicines, or respecting the alleged improper use of such preparations.

"The assistance of members of the drug trade toward the securing of definite information of the kinds indicated below will be greatly appreciated by the Commission:

"Accounts of specific cases of harmful results following the use of proprietary medicines.

"Accounts of specific cases of narcotic drug habit resulting from the use of proprietary medicines, or of the use of proprietary medicines for the satisfaction of a habit previously existing.

"Accounts of specific cases of the habitual use of proprietary medicines as substitutes for the usual alcoholic beverages.

"Information bearing upon the above should state facts and circumstances that are capable of verification."

The announcement was printed in practically every drug journal in the United States, many of whose editors were also kind enough to comment liberally upon the subject and to urge their readers to comply with the Commission's request.

The replies to our request for information have been few in number, indicating either that injuries from the use of package medicines are rare or that druggists are not willing to coöperate with the Commission by supplying such information as they may possess. To such as have responded with information the Commission hereby expresses its thanks.

One prominent Indiana pharmacist reports his personal knowledge of three opium addicts who have made use of a certain proprietary cholera and diarrhoea medicine as a substitute for morphine. This preparation, while the opium content is within the exemption of the Harrison Act, is stated to contain alcohol and ether in addition thereto, the combined narcotic effect being apparently sufficient to give the opium addict some measure of relief when he cannot obtain the stronger

drug. This same preparation has also been reported upon unfavorably by several of those answering inquiries relative to the effect of the Harrison Act, which are set forth in another section of this report. The Commission is at present in correspondence with the manufacturers of this proprietary, and will report the result of such correspondence at some future date.

The Commission has also received a printed pamphlet issued by a noted authority on the treatment of drug addiction, in which the statement is made that the author has knowledge of cases of drug addiction resulting from the use of proprietary medicines. The Chairman of the Commission addressed the author personally, requesting specific information as to the cases of drug addiction referred to for utilization in this report. The Chairman was disappointed to receive a reply from the author to the effect that this information was of a strictly confidential and professional nature and could not be imparted to the Commission.

Some partial information bearing on the subject has also been received through the courtesy of the City Chemist of one of our larger cities in which the health authorities are conducting a special campaign against valueless or dangerous proprietary remedies, based on information obtained by a canvass of physicians of the city as to the use of such medicines by their patients, or otherwise coming within their observation.

Unfortunately the information which the City Chemist could supply was of such a nature, or was of such an indefinite character, that it has a very limited usefulness for the purposes of this report.

One of the preparations complained of was a hair stain alleged to have occasioned dermatitis in the users, while two other preparations which were named are supplied directly to their patients by advertising physicians and are not obtainable through the regular drug trade, and therefore do not properly come within the scope of the work assigned to this Commission.

Of the complaints pertaining to preparations which can properly be regarded as coming within the category of patent medicines, the following are important:

Fourteen cases were cited by physicians where certain proprietary medicines were taken without benefit, or where the patient grew worse after taking the medicine.

Two cases were cited by physicians of the use of a proprietary medicine for one ailment when the patient was in fact suffering from a different ailment, and grew worse because of failure to receive early treatment for the affection from which he was suffering.

Two cases were cited of the death of infants resulting from the use of a proprietary medicine containing a narcotic drug.

One case was cited of the creation of a morphine habit by the taking of a proprietary dyspeptic remedy.

The names of the preparations complained of were given, but not the names of the persons who used them with such unfavorable results nor the names of the reporting physicians.

As the nature of the cases cited seemed to be right in line with the work of the Commission, an effort was made to obtain such definite information of the cases cited as would justify naming the remedies complained of in this report. Our correspondent, the City Chemist, was personally willing to comply with our request for more definite information, but found that the names of the patients who had received injury through the use of the preparations named, or who had

failed to receive benefit from their use, were held as official secrets and could not be imparted to the Commission.

Other leads which at first appeared promising on further investigation proved to be equally disappointing; that is, the persons claiming to possess such knowledge either revised their statements when asked to make them more definite, or claimed to possess their information in a confidential way, and were therefore unable to give the Commission any specific data by which independent investigation could be made.

As the Commission has not been able to verify any of the alleged cases of injury resulting from the use of proprietary remedies, it does not feel justified at present in reporting the names of the preparations concerning which complaints have been made.

The Commission intends to continue this particular part of its investigation during the coming year, and hopes to be successful in obtaining some accurate information upon the subject in time for its next report.

Other studies of special features of the matters assigned to the Commission for investigation have been initiated during the past year, or have been continued from former years, but are not sufficiently advanced to report upon at the present time. Some delays have been unavoidable owing to the much-regretted deaths of two of our most active and valuable workers, Messrs. Wilbert and Main, to whom the duty of making several special studies was entrusted. It is hoped that by the time of our next annual convention these subjects will be in better form for presentation to the Association.

Respectfully submitted,

J. H. BEAL, Chairman,
CHAS. CASPARI, JR.,
JOHN C. WALLACE,
W. H. COUSINS,
SAMUEL C. HENRY.

GRADUATE INSTRUCTION IN PHARMACY IN THE UNITED STATES.*

BY EDWARD KREMERS.

When in 1821 the "School" of the Philadelphia College of Pharmacy offered its first course of evening lectures to the apprentices of Philadelphia, the first step toward the realization of systematic instruction in pharmacy had been taken. No doubt, this early experiment in continuation work reflected a need that had been felt by those who had given the subject any thought whatever. In part, however, it must be looked upon as a counter movement to the proposed step toward pharmaceutical education contemplated by the Medical Faculty of the University of Pennsylvania. As an assertion of professional independence it was highly to be commended. Viewed from the point of view of Peter K. Lehman,

* Presented before joint session of Section on Education and Legislation, A. Ph. A., of the American Conference of Pharmaceutical Faculties and National Association of Boards of Pharmacy, Indianapolis meeting, 1917.

who expressed his commercial ideas in the following words: "This won't do, the University has no right to be taking our boys away at noon to make them M.P.'s," it was equally to be regretted. It would be useless, however, to discuss now, almost a century after this memorable event, what course pharmaceutical education in this country might have followed had a great university taken the initiative instead of leaving this important first step to men who saw in their apprentices, not so much the future pharmacists, as means to an immediate end.

For many a decade the road of the more ideally inclined members of the newly organized colleges was not an easy one. When, in 1789, the French apothecaries changed their organization from that of a guild of apothecaries to that of a college of pharmacy, they thereby declared to the French people that they wished to be regarded as a body of professional men and no longer as a guild of trades people. In this, their decision, they received the approval of their king. When the Philadelphia druggists in 1821 organized first as a College of Apothecaries—the name being changed very soon to that of College of Pharmacy—they likewise declared to the new world that they desired not only their independence of medicine, but that they were willing to assume the educational responsibilities of a profession. How lightly this obligation was taken by most of the members becomes apparent from the long list of those who dropped by the way as soon as the efforts of the medical faculty had been frustrated, and from the short list of names of those who were determined to strive toward the goal.

The beginnings were modest indeed. A single course of evening lectures by several medical men was all that was attempted. Pharmacy had declared its professional independence of medicine, but it had to call upon the older sister profession for its teachers. If the difficulties in Philadelphia were great, in other eastern cities, where local colleges were incorporated, the attempts either failed in large part, or, as was the case in Boston, no serious attempt at instruction was made at all for a number of decades. No wonder that the endeavor to secure educational coöperation in the first Conference of Colleges of Pharmacy did not outlast a decade.

If, in 1821, the somewhat grandiose attempt to initiate pharmaceutical instruction at the University of Pennsylvania met with failure, the small beginnings made by the University of Michigan in the sixties were more successful and gradually led to the movement, now all but universal, of pharmaceutical education by the state. Great as were the sacrifices made by such men as Squibb and others who gave not only their time and energy, but their money as well, the effort of the individual could not equal the effort of the state demanded by its druggists and supported by the entire citizenship of tax payers.

Whereas the evening courses at Philadelphia and elsewhere were of the type of the German *Fortbildungsanstalten*, after which our quite recent continuation schools are modeled, Michigan demanded the entire time and attention of her pharmacy students and made laboratory instruction the most prominent feature of the curriculum. Though Michigan was not admitted to the first Conference, yet her educational system prevailed, whereas the Conference was broken up. State university after state university has entered the field of pharmaceutical education with laboratory instruction as its backbone, and college after college has

slowly, but with resolve, added, first one modest laboratory course, then another, until laboratory instruction has become firmly established in all of them.

When the state universities entered the field of pharmaceutical instruction, they did not place the pharmacy student on a par with the regular students of their colleges. The entrance requirements were of a lower order, the time required for the completion of the course was shorter by half and even more than the conventional quadrennium. It is true the older colleges of pharmacy had no educational entrance requirements whatever, and even when the evening work was gradually displaced by day work, the actual time required was much less than that required by the universities. However, the prevalent university standards of pharmaceutical education suffered by more direct comparison.

The third step, *viz.*, the one to offer to the American student of pharmacy a course on a par with the conventional A.B. course of our colleges and universities was taken in 1892. It was received with much ridicule by the professors of the older colleges and did not even receive the condemnation of faint praise by the university teacher who had taken the very important step of placing pharmaceutical instruction on a thorough laboratory basis. However, it persisted, though in but a small way. Intended primarily as an ideal, it was soon found practical. More than ten years ago a university president referred to it as the only course to which every prospective pharmacist should aspire; a college dean has more recently heralded it as the salvation of pharmaceutical education in this country.

Thus was laid the foundation for graduate, not post-graduate work, in pharmacy. The subject of post-graduate study may be an important one, but it is not the topic of this paper. By graduate study is meant that type of educational work which is recognized as such by both the Association of American Universities and the Association of State Universities. Just as the quadrennium of the college rests on the four years of high school or academy, so the triennium of graduate study is based on the quadrennium of the college. As the work of the college implies something more than work done after the high school has been absolved, namely, study of a higher type, so graduate work implies something more by far than a continuation of study on an undergraduate plane after the coveted bachelor's degree has been received. Graduate study stands for work of the highest order given in course by the highest institutions of learning in the country.

Such work could not develop over night. It is not sufficient to map out a three years' course of study on paper. Just as the old colleges, when they inaugurated the evening courses for their schools, found that they could not supply the instructors from their own ranks for the modest courses of lectures, so the undergraduate college, not only in pharmacy, but in all lines of human endeavor, found that teachers for graduate study had first to be trained. This training was had—again in almost all lines—mostly at European universities. As France gave American pharmacy the college idea, *i. e.*, the closed corporation of the masters of the profession; as England gave us the idea of the classical college; so Germany gave us the idea of professional education in all branches and grades by the state. Moreover, she gave us the highest type of education, that which we in this country choose to designate graduate study. Hence it was in Europe, and more particularly in Germany, that not a few of our scientists received at least the final touches

of their higher education. Pharmacy constituted no exception to the rule. It is needless to state that just as not a few old-time self-made druggists were also good pharmacists, so individual teachers of pharmacy were imbued with the spirit of research, the basis of the graduate teachers' instruction, without crossing the Atlantic. Foreign journals and other publications kept alive the spark which their own individuality had kindled within them.

It is significant that the origin of graduate pharmaceutical instruction had its beginnings in the collateral sciences rather than in pharmacy proper. To anyone who has followed the trend of pharmaceutical education in this country this becomes readily apparent; and, in the light of the historical development of pharmaceutical education, it is easily understood.

Now, what should constitute graduate instruction in pharmacy?

When your speaker matriculated in the Philosophical Faculty of the University at Bonn, he was requested to inscribe his name in the Album of that faculty and the dean thereof extended to him the right hand of fellowship. The significance of these symbolic acts is this, that the student of the graduate faculty is regarded as the junior associate of the professor. The relation is no longer that of teacher and pupil, but of joint seekers after the truth, the professor being the senior, the student the junior member of this partnership. It is that of master and disciple, such as obtained in Aristotle's academy; not that of master and apprentice, a relation that obtains in the trades. It is this relationship that is characteristic of graduate work as contrasted with that of undergraduate study; though it may be necessary to emphasize that there are no hard and fast lines in study any more than in nature.

The relationship, however, is not likely to be that of one disciple to one master teacher; it is not that of a Mark Hopkins at one end of the log and a student at the other end thereof. The best opportunities for graduate work are not even found in the isolated college, but in the *universitas litterarum* with its diversified interests the aggregate of which creates the graduate atmosphere. It is the seeking of truth along many lines that stimulates the seeker of truth along the one line of endeavor to which the human being is of necessity largely restricted.

Referring primarily to undergraduate instruction, the late President Bascom, in "Things learned by living," makes the following statement: "There seem to me to be four primary qualities in good instruction, the power to impart information, the power to guide the pupil in his acquisition, the power to awaken the mind to a love and mastery of knowledge, and the power to disclose the essential unity and composite scope of truth. The professional necessity sinks from the first to the last, the personal inspiration rises from the beginning to the end. The lower excellence can hardly be secured without some measure of the higher, and the higher ceases to be permanently fruitful without a large measure of the lower."

Add to these four qualities the power to guide the student in the search for truth, also a stimulus to create an abiding love for the search after truth, and you will have essentially what is necessary to conduct graduate work.

Inasmuch as I am making these statements to a body of professional men, permit me to point out what, to me at least, has always appeared to be a fundamental error in the attitude of men of so-called pure science toward those in applied science. Just as Bascom is mistaken in supposing that teachers of the pro-

fessions must lose out in the four "primary qualities" of good undergraduate instruction as you pass step by step from the power to impart information to the power to disclose the essential unity of truth, just so many teachers of graduate students frequently have the erroneous idea that men of pure science only are concerned with the advancement of truth, and that those of applied science are but parasites who utilize the new truths discovered by their colleagues and apply them to practical or even selfish ends.

There never have been, and never will be, any hard and fast lines between pure and applied science. The investigator of truth for its own sake knows well that from every grain of truth there will ultimately develop a veritable harvest of practical application. While he may be satisfied frequently, because he is aware of his limitations, with the mere discovery and statement of a new truth, he is constantly stimulated by this knowledge. The fact that the applied scientist, also because conscious of his limitations, is so often content with the mere application of knowledge discovered by others, is no reason why this practice should be laid down as a dogma that differentiates arbitrarily between the two types of investigators. As a matter of fact modern research, in both the pure and applied camps, is giving the lie more and more to such erroneous fundamental conceptions. If arrogance has erred so frequently in one camp, false pride has erred equally in the other.

So much for the men and the spirit that should govern them. Permit me to emphasize once more that the graduate faculty does not consist of professors alone, but of professors and students. The stimulus of the young searcher after truth is often regarded as being as essential to the teacher, as the guidance of the latter is to the former.

Finally, just a brief word as to equipment. The fallacy of the trite saying of the late President Garfield, a graduate of Williams and an admirer of its famous president, that an ideal college consisted of a Dr. Hopkins at one end of a log and of a student at the other, has been pointed out by another graduate of Williams who was unquestionably more competent to judge and who regarded such catchy snatches of rhetoric as adulation. The time when a Berzelius could be a mighty guide in research to one or two students at a time in his laboratory kitchen, the use of which he had to contend constantly with his cook, is largely a thing of the past; as is also the time when a Scheele could make discoveries in his little apothecary shop laboratory at Koeping, discoveries that surprised the world then and surprise it even more to-day as we appreciate fully the significance of the results accomplished by this worker of miracles; or even the time of the more pretentious facilities of a Sertuerner who discovered the basic properties of morphine, a discovery of which we celebrate the hundredth anniversary this year.

Modern research requires money, more money, and yet more money to provide the necessary facilities. If we but consider the millions spent for agricultural research in this country, if we think of the vast sums with which medical research at the twenty-six research institutes of this country is endowed, if we reflect that a modern "*Farbenfabrik*" will allow not one but many Ph.D.'s to work year in and year out for the discovery of a new remedy, pharmacists might well lose heart and give up the idea of ever accomplishing anything worth while. Though it be true that we may scarcely hope to see another Scheele arise in modern pharmacy,

or even another Sertuerner; yet, with the right spirit, pharmacists in this country need not lose all hope.

Having already related the experience of my matriculation at the University of Bonn, allow me in closing to refer to another experience of the last day spent in Goettingen. The statue of Friederich Woehler was being unveiled before one of the academic buildings; and the four faculties, students as well as professors, were assembled to do honor to the memory of the discoverer of the truth that the substances of animal and vegetable organisms can be produced without the intervention of the life process. It was the venerable Hofmann, the author of so many excellent biographies, who delivered the address. Thinking of the campus with its essentially undergraduate atmosphere, of the laboratory with meager equipment even for undergraduate work that was awaiting him, the American student, who had received so much stimulus from his teachers at two German universities, received the greatest stimulus on that last day when the venerable Berlin professor, in pointing to the difference that existed in the equipment of the new organic laboratory in which the American had been priviliged to work for two semesters, and the meager facilities that had surrounded Woehler when he made his remarkable discoveries, said: "*Es kommt nicht auf den Kaefig an. Die Frage ist ob der Vogel der drinnen sitzt singen kann.*" It matters little whether the cage is of wood or gold, the important question is whether the bird in the cage can sing.

THE SCHOOL OF PHARMACY AND THE PROFESSION.*

BY C. FERDINAND NELSON.

It needs scarcely be emphasized that we are living in an age of extreme specialization. A thousand happenings, large and small, significant and trivial, force the conclusion home to us daily. On every side of us, in every walk and avenue of life, wheresoever we chance to turn this minute dissection of things is constantly evident. The division of the world's labor has become tremendously complex. Where but a few years ago one vocation existed ten may exist to-day. The practice of medicine is no longer a single profession, it is rather a dozen separate callings. The engineer is no longer master of his field, but picks out one small corner of it and here does his bit. One lawyer masters criminal statutes, another the law of corporations, a third constitutional or international law. This dentist pulls teeth, another fills them. Specialization rules the day and us. We are its servants whether we will or no, and wherever it leads us we must follow.

The advances in every line of endeavor that have come as a direct result of this concentration have been many and important. It will, however, not serve our purpose to discuss these here except to mention the tremendous impetus that has been given to organized training, to the importance of college and university work in the last decade. The business man, the professional man, the artisan, have all found out that they must be trained rapidly and systematically if they would compete successfully.

---

* Presented before the joint session of the Section on Education and Legislation, A. Ph. A., the American Conference of Pharmaceutical Faculties, and the National Association of Boards of Pharmacy, Indianapolis meeting, 1917.

And so of sheer necessity we find ourselves living in an age of extreme educational activity. The school has become universal. Orderly and efficient accumulation and dissemination of knowledge has become imperative. Every state has its large university; there are colleges in the land by the hundreds. Schools of medicine, law, pharmacy, engineering, dentistry, agriculture, forestry, mining, and finance are found in every state of the Union. We go to school to learn philanthropy and social science, how to nurse, how to drive an automobile, and how to play golf. Surely the classroom and laboratory are important factors in modern life.

In the professions, too, the college has become absolutely necessary. No one can become a doctor to-day who has not received a college training. A great many of our engineers and lawyers are college men. In pharmacy the state boards have awakened to the necessity of preliminary study in a school of pharmacy and before long we may well hope to see every young man or woman that enters a drug store equipped with the superior advantages which systematic training gives.

I have dwelt at some length on the point of the importance of the school in modern life because in pharmacy we have been slower to recognize this fact than in any of the other professions. Whether the cause for this lack is to be found in the fact that we have specialized less, and this is certainly true in a professional sense, is, of course, hard to determine. Certain it is that we have rebelled vigorously at each new required educational advance and there has been genuine fear in many quarters that if educational requirements kept on going forward apace, the drug market would soon be entirely depleted of men. We need more than ever to-day to reap the advantages of organized information, to encourage, support, and endow our existing schools so that they may be able to do more and more for the cause of Pharmacy and for the young men that are to enter the calling.

If the college is an important institution in the life of a profession, as we believe it is, we have a right to demand important things from it and on certain points at least we should expect leadership to come from this source. Many pharmacists have in the past wrongfully assumed that the college existed only to supply them with clerks. Were this the only function of a college of pharmacy, the profession would soon be in a sorry plight. On constructive matters, legal or professional, their advice has not been sought enough. This point the profession must sooner or later come to recognize and correct.

But what, we may ask, should the modern college of pharmacy do for the profession of pharmacy? We are all agreed that its first duty is to prepare men to practice retail pharmacy; a second function is to train men to fill positions as pharmaceutical chemists and to supply men for the wholesaling of drugs and chemicals; a third to do research work to advance our knowledge of the uses of drugs and medicines; a fourth to train teachers and investigators so that pharmacy may enlarge the scope of its activities. These are important functions and if done well would seem to be enough. And yet there is another exceedingly important phase of pharmaceutical activity to which we must give a great deal of attention in the immediate future, which the college must take upon itself to solve or at least do all in its power to help the conscientious lover of pharmacy to unravel. It is this problem to which I desire to invite your attention for a few moments.

The one conspicuous and outstanding fact in the retail practice of pharmacy to-day is the disproportion between the commercial and professional activity of the pharmacist. A great deal has been written decrying commercialism and urging us back to the prescription counter. Much has been said about the necessity for the pharmacist being the manufacturer of the drugs he dispenses, but we have entirely forgotten the question of the evolution, or thought of urging the enlargement of the scope and ideals of the profession. Pharmacy is to-day, as it was in its infancy, the science and art of preparing drugs and filling prescriptions. We must not wonder that we have floundered in a sea of commercialism with a barque so small and inadequate and outworn. The wonder is that we have survived at all. The introduction of machinery and the establishment of large manufacturing houses have forever taken from the retail pharmacist the hope of being a successful manufacturer of his own preparations. We must meet this fact squarely and recognize it. It is as useless for the retail pharmacist to compete with the manufacturer in this respect as it was years ago for the trade unions to protest against the introduction of machinery in the trades. The machine conquered, and so will wholesale manufacture of drugs. We should drop this as an ideal for retail pharmacy, but as we drop it put something in its place.

And what has happened to our prescription departments, of which we have been so proud, and upon which so much care has been lavished in the past? A few flourish, some exist, many are entirely wiped out. The average pharmacist to-day despairs of making a living on the strength of his prescription sales. And well he may if he expects only to fill the old style of prescriptions; *i. e.*, drugs, drugs for every ailment known to man. The medical profession has passed this point and we must expect the number of prescriptions written to decrease. But what have we put in its place, a professional void, to be occupied too soon by another side line? Is it not an indisputable fact that the two vital professional elements in our calling upon which in the past we have sought to stand have slipped, or are rapidly slipping, from our grasp? Is it not equally true that we have not sought to substitute anything for that which we were losing?

Pharmacy must revise its ideals and define anew and in broader terms its scope and purposes. The mortar and pestle are not adequate insignia for twentieth-century pharmacy. They serve modern life too poorly, touch it at too few angles, have become of secondary rather than primary importance. And the same holds only too true for the retailing of drugs and chemicals.

This point of view need not shock even the most conservative among us. We have but to look at our sister profession of medicine to find that time and time again it has emerged from out of the hard shell of its former practices and into a newer and better one, repeatedly has it re-defined its scope and broadened its usefulness. And yet it has not changed its name. The physician is no physicist and yet he has insisted upon mastering the technique of the X-ray machine. He claims to be no electrician and yet he will tell you much about the faradic current and the electrocardiagram. He is no engineer and yet he raises his voice on questions of sanitary problems. These things could by no possible stretch of the imagination have entered into a definition of the practice of medicine half a century ago.

May it not be that what we need more than anything else to infuse and rejuvenate the profession which we all think so much of, for to one who has been

behind the counter for years there is a real charm in pharmacy that only he knows, may it not be that what we need is to include in the definition of pharmacy something besides that which we have heretofore always included? Can we not fill the older now empty or nearly empty spaces with something besides commercial side lines? To find this out is a fifth duty of our schools of pharmacy. They should systematically study the problem and we should all help them solve it.

It can be shown with reasonable certainty that pharmacy and medicine are essentially complementary professions and that in the large their business is to solve the problems of health and disease. Anything included under these problems may, therefore, belong legitimately to pharmacy or medicine. Why we should only sell tablets and make tinctures and leave all the rest to medicine is not at all clear. The physician needs our aid along far more important lines and so does the public. Is there any logical reason, then, why we should continue as we do?

Medicine concerns itself chiefly with physical diagnosis and treatment of disease. Prophylaxis is also becoming more and more of its concern. I would like to define pharmacy as the science and art concerning itself with all of the remaining aspects of the two problems previously mentioned. This would give us professional responsibility which we need so badly, and yet not take us too far afield from pharmacy as we now know it. Particularly in things chemical are we fitted for this larger work. Our heritage is chemistry. Much that to-day is important in chemistry was brought to light in the old apothecary shop. We should undertake all of the chemical and even bacteriological work now included under medical laboratory diagnosis. Already we see the signs of the medical laboratory coming to do this work for each community. The pharmacist should anticipate this work because it really belongs to him to do. The municipal and sanitary laboratory as far as health problems are concerned should be in his hands. To the mortar and pestle should be added the test tube and Petri dish. With this combination we may reasonably hold our own—professionally do our bit and do it well. Without anything but prescriptions and patent medicines to sell to the public we cannot hope to survive. We shall drift ever farther into pure commercialism and with it will disappear every vestige of pharmacy as a distinct calling.

ARSENIC INSECTICIDE INDUSTRY PLACED UNDER THE LICENSE SYSTEM.

The Food Administration has issued the following:

With the idea of further conserving the Nation's food supply by protecting it from insect ravages, President Wilson, in a proclamation dated November 15, has placed the arsenic industry of the United States under direction of the Food Administration. The President's action comes in answer to a threatened shortage in the supply of arsenical insecticides, which are the farmer's chief protection for his crops against the onslaught of "biting insects."

All those engaged in the business of importing, storing or distributing insecticides containing arsenic are required to secure a license.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publication than those of the Association, except by consent of the Committee on Publication."—By-Laws, Chapter X, Art. III.

Reports of the meetings of the Local Branches should be mailed to the Editor on the day following the meeting, if possible. Minutes should be *plainly* written, or typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly, and manuscript should be signed by the reporter.

BALTIMORE.

The November meeting of the Baltimore Branch of the American Pharmaceutical Association was called to order by President McKinney in Harris Hall of the University of Maryland on Wednesday evening, November 21st.

The reading of the minutes of the preceding meeting was omitted.

President McKinney appointed Dr. John F. Hancock, Dr. H. P. Hynson, and Dr. E. F. Kelly as a committee to draft suitable resolutions upon the death of Dr. Charles Caspari, Jr. The following resolutions were later presented:

"*Resolved*, That this Branch has learned with deep regret of the death of Prof. Chas. Caspari, Jr.

"*Resolved*, That the Branch suspend the consideration of all other business in order to pay appropriate respect to the lamented deceased.

"*Resolved*, That the members of the Baltimore Branch of the American Pharmaceutical Association will hold in lasting remembrance the lamented Dr. Caspari, who was one of the organizers of the Branch and who continued to the time of his death a loyal and useful member.

"*Resolved*, That the Secretary be directed to transmit to the family of the deceased a copy of these resolutions and our deepest sympathy for their bereavement."

As there were several members present who were unable to attend the Caspari memorial services, request was made that they be allowed to pay tribute to him at the meeting of the Branch, and Mr. W. J. Lowry, Jr., President McKinney, Dr. H. Engelhardt, Mr. Louis Schulze, Dr. J. F. Hancock, and Dr. H. P. Hynson told how greatly their lives had been influenced by Dr. Caspari and how much they respected him and honored his memory.

Dr. J. F. Hancock then read a communication from E. G. Eberle reporting the death of President Charles Holzhauer.

Reports of the meeting of the American Pharmaceutical Association at Indianapolis were made by Dr. H. Engelhardt and Dr. E. F. Kelly. Dr. Engelhardt stated that he attended all of the meetings of the Council with the exception of one and was well pleased with the work accomplished calling especial attention to the committee appointed for research work, this work to be financed by the money accruing from the sales of the National Formulary. Dr. Engelhardt also stated that he attended all of the meetings of the Scientific Section, and enjoyed the papers presented.

Dr. Kelly's report of the Indianapolis meeting was more general. He expressed pleasure in the great interest shown by all present in the meetings of the different Sections and regretted that it was a physical impossibility for one to attend all of the meetings of all of them. He called especial attention to President Wulling's address, which dealt in a large measure with the federation of pharmaceutical organizations; to the report of the great strides made in the successful cultivation of crude drugs; to the masterly presentation by J. C. Peacock of Philadelphia and Orel Jones of Nebraska of the idea that the druggist should capitalize his responsibility; of how the House of Delegates, if properly conducted, could be made the clearing house of the Association, and that no matters other than those involving finances would then have to be brought before the Council; and to the interest elicited in the Conference of Faculties by the proposed requirement of four years' high school training, beginning with the year 1923.

Dr. Daniel Base then spoke of the great interest the students of the Department of Pharmacy of the University of Maryland had taken in the Edmonds Bill. Quite a discussion followed and the Branch went on

record as endorsing the Edmonds Bill, the Secretary being instructed to send communications to the Maryland Senators and Congressmen advising them of the action taken by the Branch.

This being the first meeting since May, several members expressed their pleasure in the large attendance and interest manifested, and promised to assist the Chairman of the Executive Committee in making future meetings equally interesting and instructive.

B. OLIVE COLE, *Secretary-Treasurer.*

DETROIT.

The members of the Detroit Branch of the American Pharmaceutical Association had the privilege of hearing two very competent men at the regular meeting, Dec. 14th.

M. O. Williams, secretary of the Michigan Drug Co., gave a talk on "The Growing, Gathering, Marketing and Retail Selling of Sponges." With samples of the different grades and species of sponges, pictures of the warehouses and markets, and a first-hand knowledge of the methods of gathering, the audience was given an insight into the sponge industry which is seldom accorded any one, except buyers.

Since practically every human being is indebted to the rubber industry from the entrance into this world to the exit and all through life, all modern inventions from the telephone to the submarine having been made possible through the same medium, the topic of "The Manufacture and Selling of Rubber Goods" was of keen interest to all present. W. S. Davison, sales manager of the Drug-Sundry Department of the Miller Rubber Company, Akron, Ohio, gave a graphic description of the manufacture of rubber goods, from the crude product to the surgeon's glove, and from his observations as a salesman he showed the necessity for the druggist to merchandise and not merely storekeep.

MAY STRAWN, *Secretary.*

NASHVILLE.

A joint meeting of the Nashville Branch of the American Pharmaceutical Association and the Nashville Drug Club was held December 13, with D. J. Kuhn presiding.

After the approval of the minutes of the previous meeting, a letter was read from Mr. Harry Hogshead, of Staunton, Va., in which he stated that his community was also having trouble in the enforcement of the prohibition laws. In an article he enclosed, entitled "Remove the Tempter," he advocated the removal of the alcohol content from the label as a means of lessening the sale of Essence of Ginger and flavoring extracts for beverage purposes.

As a result of the action taken at the last meeting, the wholesalers have volunteered to limit their sales of Essence of Ginger; the calls have also greatly decreased.

Quite a number of letters have been received recently from manufacturers endorsing the Butterick "Buy-at-Home" plan, as a result of the letters sent out by the Drug Club.

Attention was called to the increased difficulties in delivering goods due to the enforcement of the Child Labor laws. Extra charges, the cutting out of small deliveries and an appeal to the public through the press to carry home goods when possible, were some of the suggestions made to relieve the situation.

S. C. Davis, Ira B. Clark and M. E. Hutton were named as a committee to confer with the Mayor and the Sheriff in regard to the arrest of some druggists for selling cigarettes. Although there was a law prohibiting the sale of them, the last legislature licensed their sale and many paid the tax, supposing they had a right to sell them. Now their money is tied up in stock with no chance to dispose of it.

WILLIAM R. WHITE, *Secretary.*

NEW YORK.

The December 1917 meeting of the New York Branch of the American Pharmaceutical Association was called to order by President Mayer in the Library of the New York College of Pharmacy on Monday evening, the 12th, at 8:30 o'clock.

The minutes of the preceding meeting were read by the Secretary and adopted as correct.

The Treasurer submitted his report which showed a balance of $223.00 on hand. This was ordered filed.

Membership Committee.—Mr. Nitardy's application to local branch was received and passed.

Committee on Fraternal Relations.—Dr. Diner stated that there was considerable difficulty in establishing fraternal relations and that because of lack of support he would refuse to accept another nomination to his office. This report was received with regret.

Progress of Pharmacy.—Dr. Diekman because of a cold was unable to be present.

Committee on By-Laws.—Dr. Diner reported progress and promised to have a report at our next meeting.

President Mayer appointed the following members to serve on the nominating committee: Henry V. Arny, Hugo Kantrowitz, Thomas Latham.

A motion was made by the Secretary, seconded and carried that the members of our branch who entered the services of our country be allowed to continue their membership in the Branch without payment of dues until the expiration of the present war.

It was moved, seconded and carried that a page in our minutes be set aside in commemoration of Mr. Charles Holzhauer, and that the regular January meeting be devoted as a memorial meeting.

President Mayer appointed Prof. Jeannot Hostmann, Chairman, Edward A. Sayre and John C. Gallagher to serve on a committee to draw up suitable resolutions in commemoration of Mr. Holzhauer's death.

New Business.—Dr. C. P. Wimmer read a very interesting paper on "Emergency Substitutes for Sugar, Syrup, and Glycerine." The paper together with the samples shown aroused a spirited discussion. A vote of thanks was extended to Dr. Wimmer, and the meeting then adjourned.

HUGO H. SCHAEFER, *Secretary.*

PHILADELPHIA.

The December meeting of the Philadelphia Branch of the American Pharmaceutical Association was held Tuesday evening, December 4th, with the President, Ambrose Hunsberger, in the chair. Routine business dispensed with, the speaker of the evening was presented to the meeting in the person of Dr. Robert Kraus, chemist to the Phipps Institute of the University of Pennsylvania. The subject under consideration was "The Preparation of Dichloramin-T. and Chlorinated Eucalyptol 1.2."

The author went into detail concerning the preparation of the much-heralded antiseptic, dichloramin-T., and outlined a new and original method for its production, starting with toluol, and designed to furnish a perfectly stable product. The difficulty with a former method was that it did not completely purify the substance and caused, on standing, a gradual breaking down of the chemical with a consequent loss of chlorine. Dr. Kraus' paper is printed in this issue of the JOURNAL.

The preparation of the solvent, chlorinated eucalyptol, was also discussed by the speaker, who stated that it was best prepared by passing chlorine gas into eucalyptol (sp. gr. 0.922). The original Dakin technique, using potassium chlorate and hydrochloric acid for generating chlorine and chlorinating the eucalyptol was held to be unsatisfactory since the final product was not uniform in its chlorine content. Dr. Kraus brought his paper to a close by referring to the various concentrations of the dichloramin-T. in the chlorinated eucalyptol and stated that, while the range covered from a 5 to a 20 percent solution, the usual strength utilized by the surgeons was a 7.5 percent solution. By means of a test, using starch iodide as a reagent, Dr. Kraus demonstrated the absence of free chlorine in the preparation made according to the revised method, and the presence of the undesirable free chlorine in a product prepared according to the older method. Samples were shown demonstrating the various steps in the production of the dichloramin-T. and also beautiful crystals of the finished product. After referring to the excellence of the paper, the Chairman asked for a discussion of the paper.

Elmer H. Hessler stated that he had been endeavoring for some time to turn out a satisfactory dichloramin-T. and enumerated the difficulties which he had encountered along the way. Dr. Estelle Lee then in a very efficient manner, after deploring the unfortunate notoriety which this new antiseptic had attained through newspaper publicity, gave some of the experiences which he and his colleagues had gained in studying the proposition of and search for the "efficient antiseptic." He stated that the efficacy of the volatile oils as antiseptic agents had long been known and surprised the listeners by stating that eucalyptol had a phenol coefficient of 0.35 while the chlorinated eucalyptol had (comparatively speaking) the phenol coefficient of zero. This was only true, however, when tested "in glass." Dr. Lee further stated that the fact had been established, at the front, that all wounds if given proper surgical treatment within six hours after their infliction, would heal without recourse to any antiseptic at all. The search for an economical antiseptic and an efficient one, of course, was inaugurated however, to give surgeons a means of treating the wounds of those who were unable to receive immediate treatment. So far this new, dichloramin-T. was the very

best antiseptic found, and considering the fact that about fifty such "very best" antiseptics have been utilized and afterwards discarded since the commencement of hostilities, Dr. Lee granted that this was rather an assertive statement to make. Answering a question propounded by Prof. Gershenfeld, Dr. Lee claimed that the reason for the continuous success of the dichloramin-T. in chlorinated eucalyptol was not alone due to the fact that it was much more economical to use than the older Carrel-Dakin solution, but also to the fact that it did what it was supposed to do when properly prepared and properly used. John K. Thum requested information concerning the germicidal power of the solution of dichloramin-T. in chlorinated eucalyptol after precipitation had commenced. Dr. Lee, answering, stated that after the precipitation commenced the product should be discarded since precipitation was an evidence of the fact that decomposition with a consequent liberation of chlorine was occurring and that such a product became extremely irritating and, therefore, injurious when applied to denuded tissues.

Professor C. H. LaWall then referred to the formulas which the speaker has supplied and pertinently demonstrated that the formula outlined for a 20 percent solution actually made only a 16 percent solution. Both Dr. Kraus and Dr. Lee coincided, however, in stating that the error, now quite apparent, had simply been handed down to them from other sources, and that for the sake of uniformity the formulas should and would be changed. Others participating in the discussion were Dr. Fischelis, Professor Gershenfeld, Messrs. Eberle, Thum, and Hessler. Some other points brought out in the discussions are as follows: First, that dichloramin-T. can be purified by dissolving it in a weak solution of caustic soda and passing chlorine into the solution until the crystals are precipitated out. The crystals are then thoroughly dried by proper means. Second, that the amorphous form of this chemical is more stable than the crystalline form. Third, that the various strength solutions of the dichloramin-T. should be made up in small quantities and not kept on hand over seven days. Amber glassware should be the only containers. Fourth, that the solution should be made up in absolutely dry bottles, free also from alcohol or ether. Fifth, that eucalyptol is unobtainable in England at the present time, and that a search is being made for a similar product that will serve equally well as a chlorine carrier. Sixth, that the solution of dichloramin-T. in chlorinated eucalyptol has been used in several instances as a nasal spray with dire results to the user, due to its irritating the sensitive mucous membrane. It has been recommended for this purpose, well diluted with paraffin oil. Seventh, that, after all, in the prevention of infection, the chemical agent plays a very unimportant part and that proper surgical technique is the main secret of success in promoting quick healing. As Dr. Lee expressed it, surgical efficiency contributed 90 percent of the success of the treatment and the efficient antiseptic the rest.

On motion of E. G. Eberle, seconded by Prof. C. H. LaWall, the thanks of the Branch were heartily extended to both Dr. Kraus and Dr. Lee. The meeting was one of the most successful in the history of the Local Branch, and was attended by 75 persons.

IVOR GRIFFITH, *Secretary.*

LICENSE TO MAKE SALVARSAN.

Announcement has been made in Washington that three licenses had been granted by the Federal Trade Commission for the manufacture of Salvarsan (December 1). Two of the licenses are in New York and one in Philadelphia. The latter has been granted to the Dermatological Research Laboratories; the laboratories are located in the Polyclinic Hospital, and Dr. Jay F. Schamberg is director. The New York Manufacturers are Herman A. Metz Laboratories and Takamine Laboratories.

COUNCIL BUSINESS

A. PH. A. COUNCIL LETTER NO. 1.

PHILADELPHIA, PA., September 26, 1917.

To the Members of the Council:

GENTLEMEN:

The following is a list of the members of the Council for 1917–18:

Members of the Council, 1917–18.

Apple, Franklin M., 3233 W. Berks St., Philadelphia, Pa.
Arny, H. V., 115 W. 68th St., New York, N. Y.
Beal, James H., 801 W. Nevada St., Urbana, Ill.
Beringer, George M., 5th Federal Sts., Camden, N. J.
Bradley, Theo. J., Mass. College of Pharmacy, Boston, Mass.
Day, Wm. B., 701 So. Wood Street, Chicago, Ill.
Diner, Jacob, 316 W. 84th St., New York, N. Y.
Dohme, Alfred R. L., Pratt & Howard Sts., Baltimore, Md.
Dewoody, Wm. Lawrence, 516 W. 4th St., Pine Bluff, Ark.
Dye, Clair A., Ohio State Univ., Columbus, Ohio.
Eberle, Eugene G., 253 Bourse Building, Phila., Pa.
Eldred, Frank R., 3325 Kenwood Ave., Indianapolis, Ind.
Engelhardt, Hermann, 2912 Garrison Ave., Baltimore, Md.
England, Joseph W., 415 N. 33rd St., Philadelphia, Pa.
Fennel, C. T. P., 614 W. Court St., Cincinnati, Ohio.
Fischelis, Robert P., 828 North 5th St., Philadelphia, Pa.
Fuller, H. C., 19th & B Sts., N. W., Washington, D. C.
Godding, John G., 278 Dartmouth St., Boston, Mass.
Hall, W. A., 200 Griswold St., Detroit, Mich.
Hensel, Samuel T., 351 Mercantile Bldg., Denver, Colo.
Hilton, Samuel L., 1033 22nd St., N. W., Washington, D. C.
*Holzhauer, Charles, 732 Heigh St., Newark, N. J.
Hopp, Lewis C., 1104 Euclid Ave., Cleveland, Ohio.
Hostmann, Jeannot, 115 W. 68th St., New York, N. Y.
Jordan, C. B., 409 Russell St., Lafayette, Ind.
Koch, J. A., Bluff & Pride Sts., Pittsburgh, Pa.
LaPierre, E. H., 80 River St., Cambridge, Mass.
Mason, Harry B., P. O. Box 484, Detroit, Mich.
Mayo, Caswell A., 66 West Broadway, New York, N. Y.
Peacock, J. C., Erie & Broad Sts., Philadelphia, Pa.
Roehr, Clarissa M., University Hospital, San Francisco, Cal.
Sayre, L. E., Univ. of Kansas, Lawrence, Kansas.
Seltzer, L. A., 32 Adams St., W. Detroit, Mich.
Snow, Clyde M., 701 S. Wood St., Chicago, Ill.
Stewart, Francis E., 11 W. Phil-Ellena St., Phila., Pa.
Stockberger, W. W., Bureau of Plant Industry, Washington, D. C.
Whelpley, Henry M., 2342 Albion Place, St. Louis, Mo.
White, William R., 311 Grace St., Nashville, Tenn.
Wilkerson, J. A., 2036 Russell St., St. Louis, Mo.
Wulling, F. J., University of Minnesota, Minneapolis, Minn.

Total number, 40.

The following committees of the Council have been elected for 1917–18:

---

*Deceased November 19, 1917.

COMMITTEES OF THE COUNCIL.

Committee on Finance and Auditing Committee.

J. A. Koch, Chairman, Pittsburgh, Pa. Otto F. Claus, St. Louis, Mo.
E. H. LaPierre, Cambridge, Mass.

Committee on Publication.

J. W. England, Chairman, Philadelphia, Pa. C. A. Mayo, New York, N. Y.
George M. Beringer, Camden, N. J. H. B. Mason, Detroit, Mich.
E. L. Newcomb, Minneapolis, Minn.

Ex-Officio Members—The Editor, Reporter on the Progress of Pharmacy, General Secretary and Treasurer.

Committee on Invested and Trust Funds.

Wm. B. Day, Chairman, Chicago, Ill. Frederick J. Wulling, Minneapolis, Minn.
E. G. Eberle, Philadelphia, Pa. H. M. Whelpley, *ex-officio*, St. Louis, Mo.

Committee on Centennial Fund.

Charles Holzhauer, Chairman, Newark, N. J. Wm. B. Day, Chicago, Ill.
J. A. Koch, Pittsburgh, Pa.

Committee on Transportation.

Caswell A. Mayo, Chairman, New York, N. Y. Fred I. Lackenbach, San Francisco, Cal.
Wm. B. Day, Chicago, Ill. E. Floyd Allen, Minneapolis, Minn.
Lewis C. Hopp, Cleveland, Ohio. F. C. Godbold, New Orleans, La.
H. M. Whelpley, St. Louis, Mo. W. S. Elkins, Jr., Atlanta, Ga.
Charles G. Merrell, Cincinnati, Ohio. C. Herbert Packard, E. Boston, Mass.
Charles Caspari, Jr.,[1] Baltimore, Md. F. W. Nitardy, Denver, Colo.

The General Secretary and Local Secretary, *ex-officio*, members.

[1] Deceased October 13, 1917.

Committee on National Formulary.

W. L. Scoville, Vice-Chairman, Detroit, Mich. E. Fullerton Cook, Phila., Pa.
Clyde M. Snow, Chicago, Ill. H. A. B. Dunning, Baltimore, Md.
A. B. Stevens, Ann Arbor, Mich. Samuel L. Hilton, Washington, D. C.
Otto Raubenheimer, Brooklyn, N. Y. Charles H. LaWall, Phila., Pa.
Leonard A. Seltzer, Detroit, Mich. Geo. M. Beringer, Camden, N. J.
Harry V. Arny, New York, N, Y. Wm. A. Hall, Detroit, Mich.
Adam Wirth, New Orleans, La.

Committee on Standards.

George M. Beringer, Camden, N. J. ..... Term expires 1918
H. H. Rusby, Newark, N. J. ..... Term expires 1918
F. R. Eldred, Indianapolis, Ind. ..... Term expires 1918
John M. Francis, Detroit, Mich. ..... Term expires 1918
Elmer E. Wyckoff, Brooklyn, N. Y. ..... Term expires 1919
J. A. Koch, Chairman, Pittsburgh, Pa. ..... Term expires 1919
L. D. Havenhill, Lawrence, Kan. ..... Term expires 1919
E. L. Newcomb, Minneapolis, Minn. ..... Term expires 1919
Henry Kraemer, Ann Arbor, Mich. ..... Term expires 1920
Eustace H. Gane, New York City ..... Term expires 1920
B. L. Murray, Rahway, N. J. ..... Term expires 1920
W. A. Puckner, Chicago, Ill. ..... Term expires 1920
John G. Roberts, Philadelphia, Pa. ..... Term expires 1921
Otto Raubenheimer, Brooklyn, N. Y. ..... Term expires 1921
George D. Rosengarten, Philadelphia, Pa. ..... Term expires 1921
O. A. Farwell, Detroit, Mich. ..... Term expires 1921

Committee on Recipe Book.

Clarence G. Spalding, New Haven, Conn.....Term expires 1918
E. Fullerton Cook, Philadelphia, Pa.....Term expires 1918
William Gray, Chicago, Ill.....Term expires 1918
Theo. D. Wetterstroem, Cincinnati, Ohio.....Term expires 1919
P. Henry Utech, Meadville, Pa.....Term expires 1919
Wm. L. Cliffe, Philadelphia, Pa.....Term expires 1919
Otto Raubenheimer, Chairman, Brooklyn, N. Y.....Term expires 1920
C. H. LaWall, Philadelphia, Pa.....Term expires 1920
W. L. Scoville, Detroit, Mich.....Term expires 1921
W. H. Glover, Lawrence, Mass.....Term expires 1921
Curt P. Wimmer, New York, N. Y.....Term expires 1921
John K. Thum, Philadelphia, Pa.....Term expires 1922
I. A. Becker, Chicago, Ill.....Term expires 1922
Clarissa M. Roehr, San Francisco, Cal.....Term expires 1922

Commission on Proprietary Medicine.

Charles Caspari, Jr.,[1] Baltimore, Md.....Term expires 1918
S. C. Henry, Philadelphia, Pa.....Term expires 1919
J. H. Beal, Chairman, Urbana, Ill.....Term expires, 1920
W. H. Cousins, Dallas, Tex.....Term expires 1921
John C. Wallace, New Castle, Pa.....Term expires 1922

Please report errors of names or addresses.

Motion No. 1 (*Appropriation of $100 for expenses of Committee on Membership*). Moved by W. B. Day, seconded by J. A. Koch, that $100 be appropriated for the expenses of Committee on Membership. The appropriation is approved by the Committee on Finance.

Chairman Day of Committee on Membership writes:

"I find it necessary to add to the appropriation for membership work. Our budget item for the Committee on Membership is $250.00. We have paid out to the New York Branch $176.00 for commissions; two other branches $14.00, leaving only $60.00 for the ordinary work of the Committee. We have an overdraft in the account of $8.95."

At the final general session at Indianapolis, the report of the American Joint Committee on Horticultural Nomenclature was presented and it carried a recommendation that $25.00 be appropriated toward the expense of the work conducted by this joint committee. This request for an appropriation was approved by the general session.

Motion No. 2 (*Appropriation of $25.00 for expenses of American Joint Committee on Horticultural Nomenclature*). Moved by W. B. Day, seconded by J. A. Koch, that the sum of $25 be appropriated towards the expenses of the American Joint Committee on Horticultural Nomenclature. The appropriation is approved by the Committee on Finance.

Motion No. 3 (*Membership Dues in American Metric Association*). Moved by W. B. Day, seconded by J. A. Koch, that $10.00 be appropriated for an organization-membership for the American Pharmaceutical Association in the American Metric Association. This is in conformity with the recommendation of the report of the Committee on Weights and Measures which was approved by the Association at the final general session.

Motion No. 4 (*Additional Appropriation of $400 for Year Book, 1915, Vol. 4*). Moved by W. B. Day, seconded by J. A. Koch, that an additional appropriation of $400 for the Year Book, 1915, Vol. 4, be made. The appropriation is approved by the Committee on Finance.

General Secretary Day writes:

"I wish to explain that our appropriation for the Year Book, Volume III, was but $2500.00 (see Budget for 1916). The cost of the Year Book, Volume III, was approximately $2900.00, leaving a deficit of $400.00 which was taken care of at the time from $3000.00 appropriated in the 1917 budget for Volume IV. We are now that amount short in our appropriation for the current volume and the additional appropriation, as above moved, clears up this deficit.

[1] Deceased October 13, 1917.

"The approximate cost of the Year Book, Volume III, was $2901.62. The approximate cost of the Year Book, Volume IV, was $2919.77. The appropriations for these two volumes were $2500.00 and $3000.00, respectively. There may be still a few small items, such as postage or express, chargeable against the 1917 Year Book account which this additional appropriation will fully meet."

General Secretary Day writes as follows:

"The Committee on Research of the Scientific Section offered the following resolution which was adopted by the Section and approved by the third general session. You will note that it entails the appointment of a committee by the Council. The resolution is as follows:

"That the Section recommend to the Council that a Committee on Research be added to the standing committees of the Association. That this Committee consist of ten members—two to serve five years; two four years; two three years; two two years; and two one year; and that each year thereafter two members be appointed to serve five years and that this Committee be appointed by the Council and reports be presented before the Scientific Section.'

"Upon motion of Dr. Whelpley, the general session adopted the above recommendation with the request that this committee formulate rules and regulations for proposed research and report at the next meeting of the Association.

"The Committee of the Scientific Section which made this recommendation consisted of C. H. LaWall, Chairman, C. E. Vanderkleed, Wm. Mansfield, A. Viehoever, W. L. Scoville."

It has been suggested that the members of the Committee of the Scientific Section who made the recommendation be appointed as five of the ten members of the Committee. What is the wish of the Council?

J. W. ENGLAND,
Secretary.

415 N. 33RD STREET.

A. PH. A. LETTER NO. 2.

PHILADELPHIA, PA., October 16, 1917.

To the Members of the Council:

GENTLEMEN:

Word has been received of the demise of Charles Caspari, Jr., one of the foremost figures of American Pharmacy and for many years actively identified with the American Pharmaceutical Association, both as a member and officially as Permanent Secretary (1894–96), and later as General Secretary (1896–1911). He died at his home in Baltimore on Saturday, October 13, 1917, aged 67 years. Owing to heart disease he had been in poor health for several months.

Edward Kremers, Madison, Wis., addressed the Council as follows:

"Rumor has it that in an army camp the dispensary is in charge of a medical student and that he is assisted by two drug store apprentices who have enlisted. Possibly similar conditions exist elsewhere. Whether reported correctly or not, it seems to me that the A. Ph. A. owes it to our calling to ascertain just what is the pharmaceutical situation in our camps and cantonments. While I am personally interested and have asked former students to inform me, it seems to me that such an investigation as proposed should not be left to individuals, but should be regarded as an imperative duty on the part of our Association. Trusting that my suggestion may receive your favorable consideration, I remain."

W. W. Stockberger, Washington, D. C., writes as follows:

"I have only recently received Council Letter No. 1, but I wish particularly to comment upon the proposition of Professor Day's letter with respect to the appointment of a Committee on Research.

"In the meetings of the Council at Indianapolis great emphasis was laid upon Research as a very important factor in the future growth and development of the profession of pharmacy. This being the case, the appointment of a Committee on Research becomes a matter for most serious consideration, and the heavy responsibility which has devolved upon the Council should be fully realized before any action is taken. Personally, I am inclined to characterize as hasty the suggestion that the members of the Committee of the Scientific Section who made the recommendation be appointed as five of the members of the Committee.

"The Committee on Research, I believe, will be charged with the grave responsibility of organizing and stimulating research among the various bodies pharmaceutic, with the view to raising scientific investigation within the American Pharmaceutical Association to the level which has already been reached by the American Medical Association, The American Chemical Society and other organizations that have long since recognized the necessity for organization and intensive application in the field of research. The Research Committee should include the very best men of our Association—men who not only have the ability to conduct or direct research but also the proved willingness to take an active part in the work of the Committee, the necessary time at their disposal, and the professional connection through which wide influence can be exerted. It must be admitted that either through personal disinclination or because of circumstances beyond their control, some very brilliant men are unfitted to serve on important committees, and in my opinion no man should be placed on our Committee on Research until his fitness to serve thereon has been determined beyond question.

"In selecting this Committee would it not be well to choose men from various lines of activity which though divergent in their main objects yet find a common interest in pharmaceutical research. Certainly a higher degree of coördination would be attached if the members of the Committee could be selected to respresent each of the following: Colleges and Universities, Research or Experiment Stations, Departments of the U. S. Government, City Hospitals, Chemical and Pharmaceutical Manufacturers. Some such distribution of the members of the Committee is, I believe, an essential step toward arousing that general interest in the work of the Committee which is so necessary to the realization of the aims for which its appointment was authorized.

"My disapproval of the suggestion to appoint the members of the Committee of the Scientific Section as five or ten members of the Research Committee is based on the method of their selection, without regard to the personnel of the Committee itself. The election of this Committee by the Scientific Section resulted automatically following the adoption of one of the recommendations made by the chairman of the Section in the opening address at the Atlantic City meeting. This election occurred at the close of the last session of the Scientific Section, when only a small part of the membership of the Section was present. As there was no time for the deliberation and conference which should precede the appointment of an important committee, nominations were made from the floor of members present at the meeting and their immediate election resulted.

"The Council is now about to appoint, for a term of several years, members of an important committee, which will in a large measure determine the outcome of one of the most far-reaching movements ever inaugurated in our Association, and it is certainly incumbent upon us to exercise the greatest possible degree of wisdom and judgment in their selection."

Lucius E. Sayre, Lawrence, Kansas, writes:

"I have your letter of September 26th (No. 1). Reference is made to a communication from Secretary Day in regard to carrying on research, the recommendation coming through the Scientific Section of the organization.

"Permit me to state, as a member of the Council, that I hope in adding another standing committee to the many present existing ones, that the funds of the treasury need not necessarily be drawn upon to keep its work and functions alive and active. In formulating rules and regulations for proposed research there should be nothing attempted involving expenditure of treasury funds except so far as the funds are reserved or contributed for this specific purpose.

"It is stated in this communication that this Committee has been requested to formulate rules and regulations for proposed research. This seems to me to need some explanation. I should have preferred the paragraph to read that the Committee be requested to formulate plans for the stimulation of research rather than for *regulating* and *ruling* research. Research should be spontaneous, to be effective. It cannot be standardized. Stimulation should not take the place of subsidy so far as the American Pharmaceutical Association is concerned at the present time. The personnel of the Committee should be as broad as possible and to this end nominations and ballots should be resorted to in electing the members. This point seems to me to be vital to the success of the proposed Committee."

[redacted]

415 N. 33RD STREET.

J. W. ENGLAND,
Secretary.

A. PH. A. COUNCIL LETTER NO. 3.

PHILADELPHIA, PA., October 29, 1917.

To the Members of the Council:

GENTLEMEN:

Motion No. 1 (Appropriation of $100 for expenses of Committee on Membership. Motion No. 2 (Appropriation of $25.00 for expenses of American Joint Committee on Horticultural Nomenclature). Motion No. 3 (Membership Dues in American Metric Association), and Motion No. 4 (Additional Appropriation of $400 for Year Book, 1915, Vol. 4) have each received a majority of affirmative votes.

General Secretary Day writes:

"In our 1917 budget, we made no provision for buttons and pins. Dr. Whelpley has presented a bill for $71.25 for buttons and pins and I have secured the approval of the chairman of the Finance Committee and his second to a motion appropriating $75.00 for this purpose.

"Will you therefore please submit in your first Council Letter the following motion: Moved by W. B. Day and seconded by J. A. Koch that an appropriation of $75.00 be made for the purchase of buttons and pins?"

This will be known as *Motion No. 5 (Appropriation of $75 for A. Ph. A. Buttons and Pins)*.

Jeannot Hostmann writes:

"In re the Committee on Research, I would like to state that I believe Mr. Stockberger's remarks are quite pertinent. The members of this Committee will have it in their power to inaugurate a plan that will do more toward the proper recognition of professional pharmacy and pharmacists than anything that has ever been proposed. I feel, therefore, that it is incumbent upon the members of the Council that they only make said appointments after careful and deliberate consideration.

"In connection with Mr. Stockberger's remarks concerning the distribution of committee memberships among the 'Colleges, Research and Experiment Stations, Departments of the United States Government, Hospitals, Chemical and Pharmaceutical Manufacturers,' I might, at this time, call the attention of the members of the Council to the extensive research work that has been inaugurated by the American Drug Manufacturers' Association. Perhaps it would not be out of place to keep this in mind when the time for selection arrives.

"After all is said and done, however, would it really be necessary to have these various allied branches represented by membership in the Committee? All of the aforementioned bodies are already well equipped financially to pursue the proper kind of research work, and if there was appointed a committee consisting of members of the A. Ph. A. possessing the proper qualifications to direct research and the real enthusiasm to encourage it, there would certainly be no lack of coöperation with other interested organizations.

"Would it not perhaps be better if the Committee concentrated its efforts toward stimulating research among the real simon-pure professional American pharmacists? I may be mistaken, but I believe that this is what the proposers of the Research Fund had in view and I believe that there are enough members of our Association connected with professional retail pharmacy to choose from when making selections for members of the Committee."

Charles T. P. Fennel writes:

"In reference to Prof. Kremer's remarks (in Council Letter No. 2) as to the status of American pharmacists in the realm of the defense programme I will say that my intelligence not alone as an American born but as a pharmacist has been repeatedly insulted by general comment as to the pharmacist's educational qualification. In my paper at the Indianapolis meeting I attempted to bring out some of the reasons why pharmacy fails of recognition. There are many phases to the question and easy of remedy, but because we admit our shortcoming does not necessarily imply ignorance or incompetency. In the preface of a medical text-book of recent date we are informed that the valued services of the pharmacist of former days are no longer required, in fact that he is a secondary consideration in the present age. With the propaganda against pharmacy not alone by other branches of science but by pharmacists themselves, professional pharmacy will be a science of the past—the fact cannot be presented to the pharmacists of the country too strongly and it is about time that they arise in a body to defend their rights. As I have often said, every pharmacist should be a member of the American Pharmaceutical Asso-

ciation, if for no other reason than loyalty to their chosen profession. Such a wave of unselfish devotion would sweep aside every obstacle and create a true American Pharmacy. In reference to the Research matter; I have felt that silence was golden, but since the matter is open for discussion I will say that the medical profession finds fault with the pharmaceutical profession for its lack of research pharmaceutic—I doubt very much whether the American Pharmaceutical Association could father a project so vast and coupled with tremendous expense. Resolutions and delegating the same to a committee is only the beginning and not the end desired. The question is of vital import and should receive serious consideration."

Jacob Diner writes:

"In re Committee on Research I wish to indorse all that Mr. Stockberger has said. The matter of the personnel of the Committee was brought up at the meeting in Indianapolis, Scientific Section, and I remember distinctly that no definite disposition of the manner of appointing the Committee was made. The general view obtained that the Committee was to be appointed by the usual channels, Council and President of the A. Ph. A., and there seems to be no reason why the accidental connection of certain names with the motion should presuppose their appointment on such a committee."

George M. Beringer writes:

"Council Letter No. 2 raises several pertinent questions. I quite agree with Professor Kremers as to the necessity for a thorough investigation of the conditions under which medicines are dispensed in the Army and the pharmaceutical situation in the army camps and cantonments. Doubtless the Committee on Status of Pharmacists in the Government Service will look upon this as properly part of their duty.

"Dr. Stockberger's comments on the proposed appointment of a Committee on Research partly clarifie the situation. However, I feel that this matter is not yet clearly before some of the members of the Council, and, as it should become a matter of historical record, I venture a few comments on this subject.

"In the report of the Committee on Financial Control of the N. F., there was a recommendation that a percentage of the proceeds from the publication of the N. F. should be set aside toward establishing an American Pharmaceutical Research Fund. After considerable discussion, the Council agreed that there should be set aside fifty percent of the apparent profits from the publication of the N. F., toward the establishing of a Research Fund of the American Pharmaceutical Association. When the matter came up for discussion in the final general session, as a matter presented in the minutes of the Council, many of the members present appeared not to have been acquainted with the discussion that had taken place in the Council room, and did not appear to be able to differentiate between the recommendation from the Council that a committee on administration and control of the work of the research fund should be appointed, and the recommendation which came in the form of a resolution from the Scientific Section that a Committee on Research should be appointed or rather continued, as such a committee had already been provided for at the preceding annual meeting held at Atlantic City.

"The Committee as finally agreed upon, I believe, was not definitely instructed as to its duties. I quite agree with Dr. Stockberger that the full intent of the several recommendations submitted to the Association will not be fully attained by simply continuing the Committee on Research of the Scientific Section. A wiser plan would be to permit either the President or the Council to give this matter proper consideration and select a committee that will have in mind all of the suggestions that have been made towards effective work on behalf of pharmaceutical research."

W. L. Dewoody writes:

"It is much to be deplored, if our cantonments and army camps are supplied with low-grade, inefficient pharmacists. We know too well that the safety and health of our soldiers depend as much or more upon the competence of the dispenser as upon the physician. Besides, the reputation of pharmacy as a profession is largely effected by the status of the camp dispensers. I do not know the rating of the pharmacists at Camp Pike, Little Rock, but it might be possible for me to find out through my friend, Mr. W. C. Bond, son of our old friend, Dr. J. B. Bond.

"Now as to the Committee on Research Work, I believe the best course to pursue is to appoint a chairman of known ability, enthusiasm, and one thoroughly interested in research work, and allow him to submit the names for the Committee to be voted on, added to, and selected later. One such man could select a committee with more wisdom than the whole Association."

Caswell A. Mayo writes:

"As regards the Committee on Research, my view of the matter is this: The idea conveyed to my mind by the discussion and the action taken was that the Council was to appoint a committee on plan and scope for the work of the Committee on Scientific Research. This committee to be appointed now was not to be the Committee on Scientific Research in its final form, but was to be a committee on plan and scope. In the selection of this committee on plan and scope the greatest care should be exercised, of course, to include men representing each branch of the sciences included in pharmacy as well as men of constructive ability and with sufficient vision to be able to divine the future possibilities of the Committee on Research.

"It seems to me, therefore, that the Council should appoint a committee on plan and scope for the Committee on Research; that this committee should be instructed to devise a plan and scope and report to the Council for action within the next few months. This plan would be then distributed, not only to the Council members, but to others whose opinions might be entitled to weight. In fact, it might be well to have it circulated among all the members of the Association for general discussion, so that the committee could revise the plan in accordance with the criticisms received and submit a definite plan to the Council for final adoption prior to the next meeting, so that when the meeting takes place every detail of the plan would have been worked out, and it then would be the province of the Association at large to select the members of the Research Committee."

J. W. England writes:

"There seems to be some confusion as to the action taken at the Indianapolis meeting relative to the establishment of the Committee on Research and the following abstracts from the minutes may clarify the situation:

"The Resolution of the Scientific Section presented to the Council reads as follows:

"The Scientific Section recommends to the Council that a Committee on Research be added to the standing committees of the Association, that this Committee consist of ten members; two to serve five years, two to serve four years, two to serve three years, two to serve two years, and two to serve one year, and that each year thereafter two members be appointed to serve five years; that this Committee be appointed by the Council and reports be presented before the Scientific Section.'

"The subject came before the Association (in the Council minutes) at the final general session on Saturday, September 1, 1917. An extended discussion ensued and a number of motions were made. The status of the several motions being in doubt, President Wulling, in order to clear the situation, asked that the motions before the house be withdrawn. There being no objection, he declared that there was no motion before the house, to which no exception was taken.

"Dr. H. M. Whelpley then moved that the Association adopt the recommendation of the Scientific Section and instruct the standing committee to report rules and regulations at the next annual meeting, which motion was carried.

"From this it is clear that the Association directed the establishment of a Committee on Research as a *standing* committee of the Association, and requested it to report rules and regulations at the next annual meeting. Furthermore, such a committee of the Association, if existent, would obviously take the place of the Committee of the Scientific Section elected by the Section at the Atlantic City meeting (JOUR. A. PH. A., 1916, 1046, 1052).

"But, the question arises, 'Can the Association or the Council establish a *standing* committee of the Association by resolution?' And the answer is, of course, in the negative. The by-laws of the Association on 'Committees' (Chapter X), especially Article 1 (Year Book 1915, XXXIV), which specifically names the different standing committees, must be amended. And so far as the writer knows, no such amendment of the by-laws was made either at the Atlantic City or Indianapolis meeting. Hence, it would seem that no steps for the election of a *standing* committee can be taken by the Council until this is done; and this cannot be done until the next annual meeting.

"The Council, however, can elect a *special* Committee on Research and instruct it to outline working plans, considering all the suggestions that have been made, and report rules and regulations to the next annual meeting, or, as Dr. Stockberger puts it, 'to formulate plans for the stimulation of pharmaceutical research.'

The special Committee on Research can be elected directly by the Council membership, or the Council can request the President of the Association or the Chairman of the Council, or both, to appoint such a committee."

Motion No. 6 (Election of Members). You are requested to vote on the following applications for membership:

No. 1. Edmund H. J. Kochanski, 1142 8th Ave., Milwaukee, Wis., rec. by S. A. Eckstein and H. G. Ruenzel.

No. 2. Robert Henry Lewis, Jr., P. O. Box 85, Gulfport, Miss., rec. by W. P. Porterfield and Wm. B. Day.

No. 3. Jose M. Berengner, Santiago de Cuba, Oriente, rec. by J. G. Diaz and J. P. Alacan.

No. 4. Albert J. Martin, 3416 S. Spring Ave., St. Louis, Mo., rec. by H. M. Whelpley and F. W. Sultan.

No. 5. Edward C. Reick, 3201 Central Ave., Indianapolis, Ind., rec. by H. W. Rhodehamel and Francis E. Bibbins.

No. 6. Edward William Koch, 2257 N. Illinois, Apt. No. 3, Indianapolis, Ind., rec. by Charles R. Eckler and Francis E. Bibbins.

No. 7. Clara C. Hulskamp, 546 West St., Catherine, Louisville, Ky., rec. by Anna G. Bagley and Elizabeth Jenkins.

No. 8. James Cook Fuller, 1012 Baltimore Ave., Kansas City, Mo., rec. by Paul L. Hess and Wm. Federmann.

No. 9. William Wilson Rose, Georgetown, Delaware, rec. by Charles H. LaWall and Harold B. Mead.

No. 10. Miguel Saavedra Salinas, 16 Principal St., Ceiba, Porto Rico, rec. by Wm. B. Day and Clyde M. Snow.

No. 11. Alfred Frederick Brisson, U. S. S. Nereus, U. S. Navy, rec. by Wm. B. Day and J. F. Rupert.

No. 12. Cesar Daniel Andrade, P. O. Box 703, Guayaquil, Equador, S. A., rec. by Robert P. Fischelis and Charles E. Vanderkleed.

No. 13. Ernest Oreste Bianco, 2120 Crotona Ave., New York, N. Y., rec. by Jacob Diner and G. Horstmann.

No. 14. Otto F. A. Canis, Jerome Ave., Ozone Park, New York, rec. by Jacob Diner and Gustave Horstmann.

No. 15. John Nesbit Swan, Univeristy P. O., Miss., rec. by H. M. Faser and Wm. B. Day.

No. 16. George Ernest Elwers, 1625 Grand Ave., Milwaukee, Wis., rec. by H. G. Ruenzel and S. A. Eckstein.

No. 17. Anton Hogstad, Jr., So. Dakota State College of Agri., Brookings, S. D., rec. by Charles H. LaWall and M. R. LaWall.

No. 18. Frederick Clinton Dodds, Dept. of Registration and Education, State Capitol Bldg., Springfield, Ill., rec. by Wm. B. Day and E. N. Gathercal.

No. 19. Walter A. Ritter, 629 Peosta Ave., Helena, Mont., rec. by E. M. Krembs and Frank R. Keating.

415 N. 33RD ST. J. W. ENGLAND, *Secretary.*

A. PH. A. COUNCIL LETTER NO. 4.

PHILADELPHIA, PA., November 15, 1917.

To the Members of the Council:

GENTLEMEN:

Motion No. 5 (Appropriation of $75 for A. Ph. A. Buttons and Pins), and *Motion No. 6 (Election of Members; Applications Nos. 1 to 19, inclusive)* have each received a majority of affirmative votes.

Under date of October 30, F. J. Wulling writes:

"Because I was drafted into our local Liberty Loan campaign I have not had an earlier opportunity of replying to the Council Letter No. 2.

"1. I suppose the Chairman of the Council or the President of the Association will appoint a committee to draft suitable resolutions on the death of our friend, Prof. Charles Caspari, Jr.

"2. Dr. Kremers expresses my sentiments. A strong Council committee might be able to do the work suggested by him. The A. Ph. A. certainly should do something in the matter. Investigation of, and effective administration upon a matter such as this would be part of the functions of the federation of all pharmaceutic bodies that I recently recommended.

3. On the whole, I indorse Dr. Stockberger's position in the matter of a Committee on Research and I hope the matter can be pursued to a fruitful and satisfactory end.

"4. Dean Sayre's point that the Research Committee be requested to formulate plans for the *stimulation* of research rather than for *regulating* and *ruling* research is well taken, but I suppose the Committee would give such full consideration to its duties involved that it would not attempt to lay down any arbitrary rules that would defend the intention underlying the creation of the Committee."

F. J. Wulling writes (Nov. 1, 1917):

"Council Letter No. 3 at hand. Voting card has already been mailed. Your own statements on pages 10 and 11 clarify the situation. No doubt you are right that no steps were taken to create a standing Committee on Research. The remedy now is the creation of a special committee as you suggest. Of course just as much care should be exercised in the selection for the composition of the special Committee as would be observed in the composition of the standing committee. I suppose the most expeditious method of creating the Committee would be for the Council to request the Council chairman and the Association president to join in the appointing of the Committee. If a better way suggests itself, that would be the one to employ, but I would urge the least possible delay in the establishment of the Committee."

Harry B. Mason writes:

"Apropos of the recent discussion in the minutes of the Council with reference to the Committee on Research, please permit me to express the opinion that Mr. Dewoody's suggestion is deserving of consideration, namely, that a chairman of the Committee be appointed and that he be asked to recommend names for the remaining positions of the Committee. A good man like Dr. Edward Kremers, or Professor F. B. Power, of Washington, could be depended upon to make some very intelligent recommendations. Professor Power already represents pharmacy on the Research Committee of the A. A. A. S. and stands right at the front in pharmaceutical research. Dr. Kremers would also command universal respect and there are a number of other men any one of whom could be depended upon to make an efficient chairman and to be of real service in suggesting men for the Committee as a whole.

"There is a great need that pharmacy should get public credit for what it is doing. That is what has helped make medicine so powerful politically. The public, through the popular press, is being constantly informed of the 'wonderful' progress, discoveries and accomplishments that medicine is making. Pharmacy must get into the same line of activity—and this is one very important function of the new Research Committee. The purpose of the Committee is not so much to *do* research itself as to stimulate and utilize it, and in view of the great importance of this Committee it seems vital that the membership should be very carefully selected."

In re matter of Committee on Research, H. V. Arny writes:

"We need a committee of ten to handle the matter. As has been pointed out (C. L. No. 3) the Committee must be a special one this year. The suggestion has been made to nominate the five members of the Scientific Section Committee. We had last year a Council Committee on Financial Control of the N. F. whose recommendation that the apparent profits of the N. F. be placed in a Research Fund started the discussion in the final session which is now continued in the Council. This Committee consisted of five members.

"Now, why not take these ten members as a starter, call for at least five other nominees, and have the entire Council vote for ten of the fifteen members?

"There is no gainsaying the fact that this Committee has work of great importance before it and should consist of the best men available.

"There should be no snap judgment in the matter of selection and, on the other hand, the ballot should be a representative one. I should particularly regret if the election should not have at least fifteen nominees from which to make a selection."

L. E. Sayre writes:

"I move, as suggested by Secretary England (Letter 3, p. 11), that a *special* Committee on Research be elected and that it be instructed to outline working plans and to formulate plans

for the stimulation of pharmaceutical research, and report at the next meeting of the Association.

"In this connection, the mover would ask members to recall his remarks regarding this Committee in connection with Dr. Stockberger's. See Letter No. 2, p. 6."

The situation with reference to the Committee on Research is somewhat complicated but easy of solution.

The Committee directed to be established by the final general session of the Association at Indianapolis was to be a standing committee. As such action was in violation of the by-laws of the Association it falls. L. E. Sayre's motion (as above) that a *special* Committee on Research be elected is therefore in order. It is seconded by J. W. England and will be regarded as *Motion No. 7 (Establishment of special Committee on Research)*.

It will save time, also, if the other motions made are voted upon at this time, conditional, of course, upon the passage of Motion No. 7, for the establishment of the special Committee, to which no objection has been made. The three motions referred to (Nos. 8, 9 and 10) are as follows: the motion of these receiving the highest vote will carry:

Motion No. 8 (Selection of Special Committee on Research). Moved by F. J. Wulling, seconded by F. E. Stewart, that the Council chairman and the Association president join in the appointing of the special Committee on Research.

Motion No. 9 (Nomination of Special Committee on Research). Moved by Harry B. Mason, seconded by W. L. Dewoody, that a chairman of the special Committee on Research be appointed and that he be asked to recommend names for the remaining positions on the Committee; to be voted upon by the Council.

Motion No. 10 (Nomination of Special Committee on Research). Moved by H. V. Arny, seconded by C. A. Mayo, that there be placed in nomination for election by the Council fifteen nominees, as follows: The five members of the Scientific Section Committee, the five members of the Council Committee on Financial Control of N. F. and five additional nominees to be named by the Council; from these fifteen nominations, the ten members are to be elected.

Motion No. 11 (Election of Members). You are requested to vote on the following applications for membership:

No. 20. Eugene Von Hermann, 122 S. Michigan Ave., Chicago, Ill., rec. by Wm. B. Day and Wm. Gray.

No. 21. Julius G. Rapoport, N. W. Cor. Front and Christian Sts., Phila., Pa., rec. by Eugene G. Eberle and J. W. England.

No. 22. Armin Herrman Hauenstein, 414 S. Main St., Bluffton, Ohio, rec. by Wm. B. Day and Sidney Hauenstein.

No. 23. Rene Rodrigueza, Sarin Hall, Notre Dame, Ind., rec. by R. L. Greene and Emil Reyer.

No. 24. James Wilburn Patteson, Oak Cliff Pharmacy, Dallas, Texas, rec. by J. M. Fletcher and Harry Deathe.

No. 25. Lottie Hargreaves, 2725 N. Front St., Philadelphia, Pa., rec. by E. G. Eberle and J. W. England.

No. 26. Edward R. Haney, 666 N. 57th St., Phila., Pa., rec. by E. G. Eberle and J. W. England.

No. 27. Rudolph K. Dorfman, 480 N. Orianna St., Phila., Pa., rec. by E. G. Eberle and J. W. England.

415 NORTH 33RD STREET. J. W. ENGLAND, *Secretary*.

A. PH. A. COUNCIL LETTER NO. 5.

PHILADELPHIA, PA., November 16, 1917.

To the Members of the Council:

GENTLEMEN:

General Secretary Day writes:

"Following a successful meeting of the Chicago Branch on the 26th of October, and a subsequent meeting of the officers and executive committee of the Branch, we are now ready to go ahead with arrangements for the 66th annual convention. Preparatory to making these arrangements, the following motions are offered:

"1. Moved by C. M. Snow and seconded by W. B. Day, that the 66th annual convention of the American Pharmaceutical Association be held in the week beginning August 12, 1918.

"In selecting this meeting date, we have consulted the Secretary of the National Association of Boards of Pharmacy who was very anxious that the date fixed should not be too near either the first or the last day of the month, and especially not the last, because it interferes with many of the board members, who feel that they must be back at their stores on the first of September. We have also consulted with the Secretary of the National Association of Retail Druggists and, although the date for the annual meeting of that organization has not yet been fixed, he assures us that there will be no conflict.

"2. Moved by W. B. Day and seconded by C. M. Snow that E. N. Gathercoal, of Chicago, be nominated for Local Secretary.

"Mr. Gathercoal has been very active in the Chicago Branch and its secretary for the past six years. He is in a position to keep in close touch with the arrangements for the meeting and will give these arrangements his careful attention."

Motion No. 12 (Approval of Time of Holding the 66th Annual Convention of the American Pharmaceutical Association). Do you favor the motion that the 66th annual convention of the American Pharmaceutical Association be held in the week beginning August 12, 1918?

Motion No. 13 (Election of E. N. Gathercoal as Local Secretary for 1918). Do you favor the election of E. N. Gathercoal, of Chicago, as Local Secretary for 1918?

415 N. 33RD STREET. J. W. ENGLAND, *Secretary.*

A. PH. A. COUNCIL LETTER NO. 6.

PHILADELPHIA, PA., November 20, 1917.

To the Members of the Council:

The sad news has just been received of the death of Charles Holzhauer, President of the American Pharmaceutical Association, who died suddenly of apoplexy on Monday, November 19, 1917. The funeral services will be held to-morrow, 2.00 P.M., at his late home, 732 High Street, Newark, N. J.

415 N. 33RD STREET. J. W. ENGLAND, *Secretary.*

COMMITTEE REPORTS

REPORT OF THE GENERAL MEMBERSHIP COMMITTEE.

TO THE PRESIDENT AND MEMBERS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION:

The work of the General Membership Committee during the past year was conducted along the same lines as heretofore. Immediately following the convention at Atlantic City a letter was sent to every district and state chairman, urging them to undertake the campaign at once and asking them for suggestions concerning the personnel of their committees for the coming year. Two months later, a second letter was sent to every member of the committee. With this letter were sent stationery and application blanks and the members were advised of their appointment on the new committee and urged to use their efforts to build up the membership of the Association. A third letter was sent out early in the Spring and in this connection the state chairmen were given the names of the members of boards of pharmacy and officers of state associations not already in the membership of the American Pharmaceutical Association and requested to make a special effort to secure the applications of these persons.

The results of the campaign have not been altogether satisfactory, but it must be borne in mind that the many demands made upon the time and funds of every pharmacist by reason of the great war have made it difficult for all organizations to add to their membership, and, perhaps, under these unusual circumstances, we do well to hold our own. During the past year 315 new members have been elected. However, the losses during the same period have been exceptionally heavy, amounting to 291 and cutting the net gain for the year to 24 members. The total membership at the present time in 2697.

NEW MEMBERS ELECTED SEPT. 1, 1916, TO SEPT. 1, 1917, AND GROUPED BY STATES AND MEMBERSHIP DISTRICTS.

District No 1.		District No. 2.		District No. 3.		District No. 4.	
Connecticut	0	New Jersey	8	Illinois	25	Alabama	6
Maine	2	Virginia	4	Ohio	4	Arkansas	1
New Hampshire	0	West Virginia	1	Indiana	25	Cuba	1
Vermont	0	New York	68	Kentucky	3	Florida	3
Massachusetts	11	Maryland	1	Michigan	12	Georgia	3
Rhode Island	1	District of Columbia	3	Wisconsin	5	Louisiana	8
	—	Pennsylvania	22		—	Mississippi	6
Total	14		—	Total	74	Panama	1
		Total	107			Oklahoma	3
						No. Carolina	1
						So. Carolina	0
						Tennessee	7
						Texas	13
							—
						Total	53

District No. 5.		District No. 6.		District No. 7.		District No 8.	
Iowa	4	California	15	Idaho	1	Brit. America	1
Missouri	8	Colorado	5	Oregon	1		—
Kansas	1	Nevada	1	Alaska	0	Total	1
Minnesota	6	New Mexico	0	Montana	4		
Nebraska	2	Utah	1	Washington	3	Philippines	1
North Dakota	9		—		—		—
South Dakota	4	Total	22	Total	9	Total	1
	—						
Total	34						

Grand total 315

On the basis of the reports of the Treasurer made in the Council letters since the last meeting, our losses during the year, September 1, 1916, to September 1, 1917, have been as follows:

By suspension	135
By resignation	131
By death	34
Total	300
Less members reinstated	9
Total losses during the year	291
Total new members during the year	315
Net gain	24
Total membership at the close of the Indianapolis meeting	2697

Respectfully submitted,

WM. B. DAY,

Chairman of the General Membership Committee.

EDITORIAL NOTES

Editor: E. G. EBERLE, Bourse Building, Philadelphia, Pa.
Committee on Publication: J. W. ENGLAND, *Chairman;* G. M. BERINGER, CASWELL A. MAYO, H. B. MASON, E. L. NEWCOMB, and the Editor-in-Chief of the JOURNAL, General Secretary, Treasurer and Reporter on the Progress of Pharmacy, *ex-officio.*
Editorial Office: 253 Bourse Building, Philadelphia, Pa.

TEN YEARS OF THE FOOD AND DRUGS ACT.

Ten years of enforcement of the Food and Drugs Act of June 30, 1906, are reviewed in the current annual report of the Bureau of Chemistry, U. S. Department of Agriculture.

The general effect of the Food and Drugs Act may best be estimated, says the report, by considering its effect upon food and drug control by the States; upon development of the food and drug industries and by the principal abuses that have been corrected. But to illustrate the scope of the work through figures and facts the report points out that more than 6,000 prosecutions have been terminated in the courts in the first decade of the Act; that manufacturers have been cited at hearings more than 40,000 times, that many thousands of factory inspections have been made, and that more than 750,000 shipments of domestic or imported food and drugs have been examined..

One consequence of the enactment of the Food and Drugs Act was to encourage similar legislation in many of the States, the purpose of which is to control local traffic in food and drugs which, since no interstate commerce is involved, are not subject to the Federal law. The Federal law supplements the State law in this respect and now most of the States have similar laws. In the beginning the confusion and apparent conflict between local and Federal laws and administration of laws not only made it difficult for the two sets of officials to cooperate, but often made it necessary for manufacturers to make special preparations for shipment to certain States at extra cost, the extra cost being passed on to the ultimate consumer. This evil has been remedied to a considerable extent by the organization of two agencies which in a large measure have removed some of the difficulties arising from the conflict of Federal and State jurisdiction. These agencies are: (1) The Joint Committee on Definitions and Standards, and (2) The Office of Coöperative State and Federal Food and Drug Control.

Frequently, the report says, the Bureau is appealed to by the industries to compel the cessation of unfair practices and to encourage the standardization of the products, when the industry is incapable by itself of bringing about these results. The Act is described as one of the influences which have helped to draw competitors together into associations like the guilds of the middle ages, although the modern associations lack the special privileges which the ancient guilds often enjoyed.

Some of the associations, understanding the value of constructive work, now devote considerable money to experimental research into technical problems. Thus is made available to the small manufacturer scientific assistance ordinarily beyond his reach. Since the Bureau of Chemistry always has regarded it as its duty not merely to report violations of the law but also to prevent accidental violations, through constructive work in tending to improve methods of manufacture, it coöperates actively with such associations of manufacturers. Such coöperation, by the various Government agencies, says the report, is bound to exert the profoundest influence on the country's industrial and social development.

The best evidence, according to the report, that many of the abuses formerly occurring in the food industry have ceased is found in the fact that the violations of the Food and Drugs Act observed to-day are hardly comparable, in degree, with those in the first few years following the enactment of the law.

MILITARY ORGANIZATION.

A company, now, is composed of 250 men, commanded by a captain.

A battalion consists of four companies, commanded by a major.

A regiment consists of three battalions, a machine gun company and a headquarters company band, commanded by a colonel.

A brigade is composed of three regiments, commanded by a brigadier-general.

A division consists of three brigades of infantry, one brigade of artillery, one regiment

of cavalry, a battalion of engineers, an air squadron, a battalion of signal troops, and a motor train and wagons.

With a division there are nearly 10,000 animals, and an army of attendants, besides 600 motor trucks and their drivers, a dozen airplanes, four dozen ambulances and three dozen automobiles, 75 big guns, and about 300 other carriages.

NEW YEAR'S DAY.

The Robertson-Bradshaw Company has issued a New Year message worth repeating and so we publish it.

New Year's Day means another chance.

Thank God there's always another chance.

Whoever said that Opportunity knocks once, meaning once only, at every man's door, was fooling you. Don't believe it. For opportunity comes around to your door every morning, regularly as the milkman.

We don't have to live our lives all at one stretch; if so, WHO would endure a week? But our lives are allotted to us in day by day parcels. And between every two days of life we are dipped in death.

Every morning is a resurrection. And New Year's day is "the Great Gittin' Up Mornin'." The Past is sloughed off. Its mistakes we bury. Its successes will not do for next year. Into the dump with all of 'um!

DESTINY on New Year's Morning is dealing us a New Hand. Sit up, gentlemen! Smile, and try again! The game goes on. Better luck this year! Come! We'll try again.

And may God bless us all!

Dr. J. H. Beal has received the endorsement of the National Association of Retail Druggists for place on the Advisory Commission to the National Council of Defense. At a meeting of the chairmen of six organizations represented in the National Drug Trade Conference a like endorsement was unanimously given. It is not unbecoming to say that no one would be more acceptable to the drug trade of the country, and it is to be hoped that he will consent to accept. In this connection it should be said that few, if any, have and do give as much of their time for the benefit of pharmacy as Doctor Beal.

Cyrus P. Walbridge, president of the J. S. Merrill Drug Company of St. Louis, recently suffered a stroke of paralysis, from which he is recovering. Mr. Walbridge was vice-president of the St. Louis World's Fair and prominent in political and civic affairs. While a member of the American Pharmaceutical Association, he has been more actively interested in the National Wholesale Druggists' Association, of which he was president in 1898.

Prof. C. T. P. Fennel, dean of the Cincinnati College of Pharmacy, has been appointed professor of Materia Medica in the University of Cincinnati.

Kenneth B. Hay, son of deceased member Charles La Mar Hay, DuBois, Pa., a second-year student of the Philadelphia College of Pharmacy and who enlisted in the Pennsylvania Hospital Unit No. 10, died in France on Thanksgiving Day.

Pharmacist's Mate Elzer Harwell, whose home is at Scotts Hill, Tenn., and one of the officers and crew of the U. S. Destroyer "Fanning" was given honorable mention not only by the commander but also by the British commander-in-chief, in the destruction of a German submarine November 24. The special act of bravery for which he was commended was for jumping overboard and saving a drowning German.

Mallinckrodt Chemical Works celebrated the fiftieth anniversary of the founding of its business, December 19, by giving a banquet at the Mercantile Club, Saint Louis. It was one of the most notable events occurring in the local drug and chemical trade circles for a number of years. About 150 guests were present, including the representatives of the various branches, heads of departments, etc.

Mr. L. G. Blakeslee presided as toast-master and interesting and appropriate remarks were made by Messrs. Edward Mallinckrodt, Sr., President of the company; Edward Mallinckrodt, Jr.; O. L. Biebinger, Secretary; H. T. Jarrett, Manager of the New York house; L. G. Ryan, Manager of the Canadian house; J. H. A. Fink, Export Department, New York City; H. W. Huning, who has been with the house since its organization; also by Messrs. Dronberger, Appleton and other representatives.

One of the most important features of the evening was the presentation to Mr. Edward Mallinckrodt, Sr., on the part of the employees, of a beautiful bronze tablet or medallion prepared from one of his recent photographs. The presentation was made by Mr. Blakeslee with very appropriate and impressive words, and Mr. Mallinckrodt's response was largely in the way of a review of the leading events in the history of the company.

OBITUARY.

IN MEMORY OF CHARLES HOLZHAUER.

(*Continued.*)

RESOLUTIONS ADOPTED BY THE EXECUTIVE COMMITTEE OF THE NATIONAL ASSOCIATION OF RETAIL DRUGGISTS.

WHEREAS, it was the will of Almighty God to remove from our midst Charles Holzhauer, President of the American Pharmaceutical Association; be it

Resolved, That, on behalf of the officers and members of the National Association of Retail Druggists, we do hereby extend our deep sympathy and express our profound regret to the officers and members of the American Pharmaceutical Association and the family of our distinguished deceased fellow pharmacist.

(Signed) W. H. COUSINS, *President.*
SAMUEL C. HENRY, *Secretary.*
JAMES F. FINNERAN,
Chairman Executive Committee.

Chicago, December 8, 1917.

EDWARD A. SAYRE.

The sudden death of President Charles Holzhauer has shocked the entire profession. Since he joined the American Pharmaceutical Association in 1873, he has been a consistent member, rarely missing a meeting. He enjoyed the gatherings of so many kindred spirits. He was a self-made man; he was a good listener; he heard what others had to say, sometimes enjoying the debate, but regretting the waste of time on matters of little importance. If he spoke, it was when a lull came, and then in a few quiet words he showed that he had digested what had been said and usually he had the last word. His was a judicial mind. Every honest pharmacist has lost a friend, he was my life-long friend, more like a brother; my loss is the greater.

WILLIAM B. DAY.

Coming so soon after the Indianapolis meeting, where President Holzhauer took so active a part and appeared so well and vigorous, his death was a great shock to me. The American Pharmaceutical Association and pharmacists generally have lost a most loyal friend and advocate. Charles Holzhauer's labors in his chosen profession were fruitful but by no means represented the full measure of his activities. A public-spirited citizen, he gave to his city the same loyal support and the same endeavor to promote the welfare of its citizens that made him a conspicuous exponent of what is best in pharmacy. The Association can ill afford to lose his services. His death breaks another link in the chain of those earnest workers who did so much for the upbuilding of the American Pharmaceutical Association and for pharmacy.

J. H. BEAL.

I was more deeply grieved than I can state to learn of the sudden death of President Holzhauer.

President Holzhauer was a fine type of American pharmacist. His sturdiness, manliness and straightforward methods endeared him to the membership of the American Pharmaceutical Association to which for so many years he rendered loyal and valuable services.

Mr. Holzhauer never put himself in the way of honors. The various offices which came to him were unsought, and were bestowed because of his known faithfulness in the discharge of every duty entrusted to his care.

His election to the presidency of the American Pharmaceutical Association was a just recognition of his character and services, and there is not a member who does not feel a sense of personal loss in his death, and who does not grieve that he could not have been spared at least to round out his year of administration in the office which he regarded as the highest of all honors.

H. V. ARNY.

The Association has lost more than a president, it has lost a faithful, devoted member. Pharmacy has lost more than a careful druggist, she has lost a leader. Mr. Holzhauer's personal acquaintances have lost more than a pleasant companion, they have lost a good counsellor, a generous associate, a friend as true as steel.

C. T. P. FENNEL.

The news of the death of Charles Holzhauer was a shock indeed. I have known him for over thirty years and from the first day of friendship was strongly attracted to him by his kindly disposition, "open and above board" character, sound judgment on the ideals of American pharmacy. We have again lost one who was a credit to himself and family, citizenship and society and to American pharmacy.

L. E. SAYRE.

The death of President Charles Holzhauer is another sad blow to the band of faithful workers in our Association and I cannot tell you how much and how deeply I feel the loss of this good man whose untimely death has left the presidency of the Association vacant.

JOHN F. FISCHNAR.

John F. Fischnar died suddenly at his residence at 6920 Perry Ave., Chicago, Nov. 12, 1917. He was born at New Ulm, Texas, in 1878. His education was obtained through his own efforts largely and under adverse circumstances. He entered the Northwestern University School of Pharmacy in 1890, graduating with the degree of Pharmaceutical Chemist and a high record for scholarship.

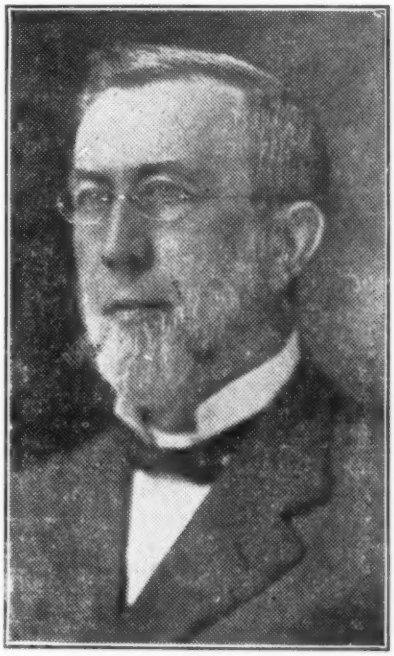
In 1904 he was happily married to a classmate in the Pharmacy School, Miss Nina Piper, who survives him. In 1905 he purchased a drug store at Sixty-ninth St. and Wentworth Ave., and conducted it successfully to the time of his death. He was a member of the faculty of the Northwestern University School of Pharmacy for about ten years as an instructor in the Pharmacy Department where he was highly esteemed by his colleagues and greatly respected by his students.

He became a member of the American Pharmaceutical Association in 1905 and was elected a vice-president of the Chicago Branch of that Association for 1917. He was also a member of Normal Park Masonic Lodge No. 797 and of the Chicago Retail Druggists' Association. He was a man of sterling character and very steadfast in his friendships. The stores in the neighborhood were closed during the funeral services showing the regard in which he was held by his business associates. M. A. MINER.

CHARLES T. GEORGE.

Charles Theodore George, pioneer druggist of the West End, Harrisburg, Pa., and for many years secretary of the Pennsylvania Pharmaceutical Examining Board, died at his home December 26th.

The deceased was born in Homberg, Landgraviate of Hesse, Germany, February 2, 1845, and came to America when a lad of six years. He was educated in the public schools of Harrisburg, after which he entered the drug business and soon after reaching his majority opened a drug store on his own account. He was a member of the Philadelphia College of Pharmacy, an honorary member of its Alumni Association and also of the University of Western Pennsylvania. For many years he was a dominating figure among the druggists of Pennsylvania, and stood for high ideals in his profession.



CHARLES T. GEORGE

He was a member and president of the Harrisburg Board of School Directors, active in Masonic and church circles. In the former he had received nearly all of the degrees in both York and Scottish Rite bodies; in the latter, he had helped in the organization of the Bethlehem Lutheran Church, of which he was a life-long member.

Mrs. George died about four years ago, and he is survived by one daughter, Mrs. Raymond E. Reed, two grandchildren and two great-grandchildren.

Mr. George joined the American Pharmaceutical Association in 1873.

AARON B. CALISHER.

Aaron B. Calisher, treasurer of the Manufacturing Perfumers' Association of the United States, died December 10, at his home in New York City, aged sixty years. He was senior member in the firm of Calisher & Co., and was a controlling factor in the business of Oakley & Co.

SOCIETIES AND COLLEGES.

WAR COUNCILS COMMITTEE OF THE CHAMBER OF COMMERCE OF THE UNITED STATES.

The above-named committee met in Washington December 12th; the appointees from the American Pharmaceutical Association were Messrs. S. L. Hilton, A. R. L. Dohme and J. H. Beal. The object of the committees is to give the Government the benefit of the suggestions and advice of the industries involved. The several associations of the drug trade represented were the American Pharmaceutical Association, the National Association of Retail Druggists, the National Wholesale Druggists' Association, the American Association of Proprietary Medicines, the American Drug Manufacturers' Association and the National Association of Pharmaceutical Chemists. At a meeting of the latter bodies it was decided, in view of the request by the War Councils Committee, that one organization represent the drug industries, that the National Drug Trade Conference be designated. A meeting has been called to meet in Baltimore, January 3rd. Dr. J. H. Beal was named as the unanimous choice for general representative and as the Government expert to work with the Council of National Defense. At this writing it was not decided whether he could accept the appointment.

THE NATIONAL PHARMACEUTICAL SERVICE ASSOCIATION.

Three hundred and forty-five new members were added to the roll of the National Pharmaceutical Service Association at its seventh monthly meeting held at the Philadelphia College of Pharmacy, Tuesday evening, December 11th.

Dr. Henry P. Hynson of Baltimore, who had been invited to speak on the organization of a Pharmaceutical Corps in the Army, stated that there were two ways open to pharmacists for securing such a corps. One was to induce the medical profession and the Surgeon-General's office to favor such a measure, and the other was to have a bill similar to the Edmonds Bill passed by Congress over the head of the Surgeon-General. Dr. Hynson told of his connection with the Rotary Clubs and of the coöperation that could be afforded the movement for the passage of the Edmonds Bill by Rotarian pharmacists. Dr. Hynson said that he would make it his first "order of business" to secure the coöperation of Rotary Clubs throughout the United States in behalf of the Edmonds Bill. He also mentioned the desirability of having the support of the National Drug Trade Conference in pushing this measure through Congress.

Mr. Caswell A. Mayo of New York, who had also been invited to speak on the Edmonds Bill, made a very interesting address based on his experiences in the various camps which he has had an opportunity to visit. He declared that it was absolutely necessary for the welfare of our Army to have adequate pharmaceutical service and urged that subscriptions be asked for so as to swell the funds of the N. P. S. A. sufficiently to be able to carry on an active propaganda in behalf of the measure. It was moved, seconded and carried that the secretary send out letters asking for contributions for this work and it was also decided that the Executive Committee be instructed to prepare literature telling of the work of the N. P. S. A.

Upon motion by Mr. Eberle it was decided to ask the National Drug Trade Conference and other associations for their active coöperation in this work.

A hearty vote of thanks was given Mr. Mayo and Dr. Hynson for their attendance at the meeting and for the messages which they had brought.

1918 N. A. R. D. CONVENTION AT NEW ORLEANS.

The Executive Committee of the National Association of Retail Druggists at their recent meeting in Chicago selected New Orleans, Louisiana, the place for the 1918 meeting of the association.

AMERICAN METRIC ASSOCIATION.

The annual meeting of the American Metric Association was held at the University of Pittsburgh, December 28th and 29th. Among those who presented papers and addressed the body were—George W. Perkins of New York; J. W. McEachern, of the Crane Company, Chicago; Dr. William C. Wells, chief statistician of the Pan-American Union; Henry D. Hubbard, of the United States Bureau of Standards; and Dr. John D. Brashear, past president of the American Society of Mechanical Engineers.

AMERICAN CHEMICAL SOCIETY.

A fund has been started by the American Chemical Society for a suitable memorial

to Joseph Priestley, who came to Philadelphia after being ordered out of England; he later moved to Northumberland, Pa., where he died and is buried.

The committee has made the following recommendations:

1. That a bust portrait of Joseph Priestley be secured; that this be retained by the American Chemical Society, but be deposited as a loan in the National Museum in Washington.

2. That a gold medal be awarded at intervals of probably more than one year for superior achievement in chemical research, the award to carry with it the requirement that the recipient shall deliver an address before the general meeting of the society at the time of the presentation or at such other time and place as the council of the society may direct.

BALTIMORE DRUG EXCHANGE.

The Baltimore Drug Exchange held its annual meeting December 13th. Dr. A. R. L. Dohme spoke on pharmacy, past, present and future, outlining the changes that had taken place, and James E. Hancock also spoke. The following officers were elected:

President, A. E. Mealy; *First Vice-President*, J. Emory Bond; *Second Vice-President*, James E. Hancock; *Secretary*, George M. Armor; *Treasurer*, H. H. Robinson; *Executive Committee*, W. M. McCormick, and Dr. A. R. L. Dohme.

THE NEW YORK GERMAN APOTHECARIES SOCIETY.

The German Apothecaries Society of New York has celebrated its sixty-sixth birthday; A Christmas meeting was held December 27th, to which the members and their families were invited and a regular meeting of this time-honored organization was held January 3rd. The special meetings are social and invariably successful and enjoyable.

MASSACHUSETTS COLLEGE OF PHARMACY.

A service flag, containing thirty stars, was unfurled at the Massachusetts College of Pharmacy on Monday noon, November 26th. Short addresses were made by President Herbert Packard and Dean Theodore Bradley. Instructor Florin J. Amrhein read a list of the names of those represented by the stars on the flag which was unfurled by Bertha Sugden, Ph.G., a graduate student at the College. The thirty stars represent one officer of the College, five members of the class of 1917 who went directly from the College into military or naval service, and twenty-four undergraduates. About the same number of graduates of the College are also in the service, but stars are not included for them on this flag, which represents the present student body.

THE COLLEGE OF PHARMACY, UNIVERSITY OF MICHIGAN.

The Pharmacy Faculty of the College of Pharmacy, University of Michigan, in an endeavor to do its bit to support the Edmonds Bill, recently drew up the following petition, a copy of which was sent to all United States Senators and Representatives from Michigan:

> "We, the undersigned, wish to call your attention to the following reasons why we urge your support of the Edmonds Bill known as Number H. R. 5531, which will be brought up in the December session of Congress, and which is intended to increase the efficiency of the Medical Department of the United States Army, to provide a Pharmaceutical Corps in that Department, and to improve the status and efficiency of the Pharmacists in the Army:
>
> "First. It will increase the efficiency of the Medical Corps of the U. S. Army by supplying a place for specially trained men who can coöperate with physicians and surgeons.
>
> "Second. The enlistment of the professional services of properly qualified pharmaceutical chemists will enable physicians and surgeons to devote more of their time to the diagnosis and direction of the care of sick and wounded.
>
> "Third. It will give the profession of Pharmacy a standing in the Medical Corps, and will afford an opportunity for the promotion of pharmacists for special services which they may render, and place the profession on the same basis as that already established for Dentistry and Veterinary practice.
>
> "Fourth. Not only as a war measure, but in the development of the U. S. Army in times of peace, there must of necessity be developed a closer association between pharmacists and the medical profession."

It is interesting to know that President Hutchins' name headed the list of signers, and was followed by the names of the Pharmacy Faculty, *all* the druggists of Ann Arbor, and the students of this College.

PHILADELPHIA COLLEGE OF PHARMACY.

The Philadelphia College of Pharmacy has a flag of 153 stars displayed in the college library and designates that from among the recent graduates and student body that number have enlisted in the Government service. With few exceptions the enlistments were voluntary and so far as known, none eligible for service endeavored to become exempt from the draft.

ST. LOUIS COLLEGE OF PHARMACY.

The following resolutions were passed by the Board of Trustees at the November meeting, and a copy ordered sent to the pharmaceutical press:

PROFESSOR CHARLES CASPARI, JR.

The St. Louis College of Pharmacy records with deep sorrow the death of Professor Charles Caspari, Jr., one of America's foremost and distinguished pharmacists, teachers and pharmaceutical writers.

We recognize the extended and self-sacrificing service which he has rendered to our whole profession with the deepest feeling of gratitude and we rejoice in the sublime record made by him and in the exemplary life he has led.

Among his numerous friends, the St. Louis College of Pharmacy desires to pay its tribute of respect and esteem to his memory.

Be it therefore,

Resolved, That the St. Louis College of Pharmacy express to the family of our deceased friend and co-laborer, its deepest sympathy in their bereavement.

The College joins the pharmacists of America in honoring the memory of Charles Caspari, Jr.

The Committee,

FRANCIS HEMM,
OTTO A. WALL,
H. M. WHELPLEY,
F. W. SULTAN,
AMBROSE MUELLER.

UNIVERSITY OF WASHINGTON.

DEPARTMENT OF PHARMACY.

The Pharmacy Department of the University of Washington is "doing its bit" by encouraging farmers to collect digitalis leaves. Instructions have been set out relative to proper collection, drying and packing. If the collectors are uncertain regarding the drug, they are advised to send samples to the University for indentification. In this way considerable digitalis has been harvested.

THE PHARMACIST AND THE LAW.

THE RETAIL LIQUOR DEALERS' LICENSE.

As far back as 1874, Geo. H. Schaefer, an honorary president of the American Pharmaceutical Association, advocated that retail druggists be not classed with liquor dealers. The matter was brought up at the Louisville meeting of the A. Ph. A. in the year named, and he believes that the time is most opportune now to do away with a classification which is entirely unjust.

PENNSYLVANIA BOARD OF PHARMACY GIVES NOTICE OF CHANGES IN THE STATE DRUG LAW.

The Pennsylvania Board of Pharmacy has sent out notices and comments on several sections of the amended State drug law.

Section 3 of the Drug Act has been amended and reads as follows:

"That for the purpose of this act an article shall be deemed to be adulterated.

"First. If a drug is sold under or by any name recognized by the ninth revision of the Pharmacopoeia of the United States, the fourth edition of the National Formulary, or the American Homeopathic Pharmacopoeia, it differs from the standard of strength, quality, or purity as determined by the test or formula laid down in the ninth revision of the Pharmacopoeia of the United States, the fourth edition of the National Formulary, or the American Homeopathic Pharmacopoeia; provided that no drug defined in the ninth revision of the Pharmacopoeia of the United States, the fourth edition of the National Formulary, or the American Homeopathic Pharmacopoeia except official preparations of opium, iodine, peppermint, camphor, ginger and ethyl nitrite, shall be deemed to be adulterated, under this provision, if the standard of strength, quality, or purity be plainly stated, in juxtaposition with the official standard of strength, quality, and purity, upon the bottle,

box or other container thereof, although the standard may differ from that determined by the test or formula laid down by the ninth revision of the Pharmacopoeia of the United States, the fourth edition of the National Formulary, or the American Homeopathic Pharmacopoeia.

"Second. If its strength or purity fall below the professed standard or quality under which it is sold."

Section 4 has been amended to read that an article shall be deemed to be misbranded, "If its package or label shall bear or contain any statement, design or device regarding the curative or therapeutic effect of such article, or any of the ingredients or substances contained therein, which is false or fraudulent."

All distributers of drug products are requested by the board to join in making it a rule of the trade to send United States Pharmacopoeia and National Formulary products on all orders from pharmacists for drugs under official titles with no other qualifications as to quality.

A careful study of Section 3, of the Drug Act, as amended, will show that both the standard of strength, quality and purity possessed by the article which differs from the official standard, and its official standard of strength, quality and purity must appear upon the label, side by side, of every such article sold, or offered for sale in Pennsylvania.

U. S. COURT UPHOLDS RIGHT TO INSERT DESCRIPTIVE MATTER IN MEDICINE CARTONS.

United States Circuit Court Judge Ward, with the concurrence of Judges Mayer and Hand, has ruled against the appeal of E. Fougera & Co. for an injunction restraining Attorney-General Lewis and District Attorney Swann (New York) from enforcing the Section 1142-*a* of the penal law in regard to the advertising of remedies for certain named diseases, by the enclosure of reading matter, or by advertising in any other manner.

In his decision, Judge Ward cites the fact that the medicines sold by the defendants which come under this provision are accompanied by statements in regard to the diseases they are intended to cure, together with the dosage, either on labels, pasted on the container, or bottle, or in a circular folded inside the container. The medicines are also advertised in newspapers and medical journals. He then continues:

> "We cannot assume that the Legislature intended to require proprietary medicines for the diseases mentioned to be sold without any indication of the diseases for which they were intended, or without any direction as to the doses to be taken, nor do we think that a circular inserted in the container going, not to the public generally, but only to the purchaser, is an advertisement within the meaning of the act. Such a construction of the ordinary directions of the family physician on a bottle of medicine would be regarded as absurd."

The decision thus rules that the law of the State of New York does not prohibit the sale of remedies for certain diseases, named in the statute, even though dosage, name of remedy and other descriptive matter are cited on labels, on containers, or in circulars enclosed within the containers.—*Paint, Oil and Drug Reporter.*

STATE PROTECTION OF TRADE-MARKS.

Trade-mark protection by the several states as well as by the Federal government is discussed in *Popular Mechanics Magazine* by H. H. Windsor, the editor, who says in part:

Within the last two years several corporation lawyers making a specialty of trade-mark practice have placed increasing importance on the subject of protection of trade-marks by filing individual state applications for the same in almost every state in the United States, in addition to seeking also the protection afforded under the Federal Trade-Mark Act.

Litigation concerning trade-marks is of unusual character in that there does not seem to have been any uniformity of decision under the Federal Trade Act, due to the fact, partly, that the circumstances of the different cases are not similar. Therefore, the decision of the United States Supreme Court in the near future, in what is known as the "United Drug Company trade-mark case," is awaited with interest.

A few years ago, H. A. Jaynes was sued as agent of the United Drug Company by one Ellen M. Regis, who desired to prevent the use of the word "Rexall." The Regis woman had established the word "Rex" as a trade-mark under the state statute of Massachusetts of 1895, by filing her trade-mark in a proper application with the Secretary of State, in

accordance with the laws of the commonwealth, on Sept. 27, 1898, and the registration was given the official number 673.

The validity of the trade-mark "Rex" and the title thereto of the said Regis, was twice adjudicated by the Supreme Court of the State of Massachusetts after strenuously contested and protracted litigation. In the last appeal, the Massachusetts Supreme Court sustained the contention of the lower courts that the word "Rexall" was an infringement of the word "Rex." Later, the United Drug Company paid $100,000 for an assignment of the rights of the Regis mark.

It must be remembered that all one can claim under the Federal act is an "interstate trade-mark." Surely all the incidents of a common-law mark are better perfected when the state application for the registration of a mark has been made to and the right issued by the Secretary of State.—*Drug and Chemical Markets.*

CHANGES OF ADDRESS.

All changes of address of members should be sent to the General Secretary promptly.

The Association will not be responsible for non-delivery of the Annual Volume or Year Book, or of the JOURNAL unless notice of the change of address is received before shipment or mailing.

Both the old and the new address should be given thus:

HENRY MILTON,
From 2342 Albion Place, St. Louis, Mo.
To 278 Dartmouth St., Boston, Mass.

Titles or degrees to be used in publications or in the official records should be given, and names should be *plainly* written, or typewritten.

CHANGE OF ADDRESSES SINCE NOV. 18, 1917.

NITARDY, F. W.
From Scholtz Drug Co., Denver, Colo.
To 1418 Cherokee St., Denver, Colo.

WILLIAMSON, H. H.
From U. S. Naval Training Station, Great Lakes, Ill.
To U. S. S. Susquehanna, c/o Postmaster, New York, N. Y.

JORGENSEN, ARTHUR
From 1026 B. Shotwell St., San Francisco, Cal.
To 781 Castro St., San Francisco, Cal.

HILTERBRAND, E. A.
From 4011 Colonial Ave., Dallas, Texas.
To 1014 W. 18th St., Oklahoma City, Okla.

KUENZIG, P. A.
From 316 Atlantic Ave., McKeesport, Pa.
To 121 Spencer Ave., Carrick, Pa.

MAISEL, JOSEPH
From 860 Fox St., New York, N. Y.
To 989 Amsterdam Ave., New York, N. Y.

UNITED STATES PUBLIC HEALTH SERVICE.

List of changes of duties and stations of commissioned and other officers of the United States Public Health Service for the seven days ended December 5, 1917.

Phar. F. J. Harty. Relieved at the San Francisco Quarantine Station. Proceed to Cincinnati, Ohio, for duty in the studies of the pollution of navigable streams. Nov. 30, 1917.

Phar. B. E. Holsendorf. Relieved at San Juan, P. R., Quarantine Station. Proceed to Philadelphia, Pa., for duty. Nov. 28, 1917.

Phar. F. A. Southard. Relieved at Cincinnati, Ohio. Proceed to the San Francisco Quarantine Station for duty and assignment to quarters. Nov. 30, 1917.

Phar. J. A. Wolfe. Proceed to Atlanta, Ga., on special temporary duty. Dec. 3, 1917.

Phar. M. B. Berkowitz. Relieved at Norfolk, Va. Proceed to San Juan, P. R., Quarantine Station for duty and assignment to quarters. Nov. 28, 1917.

Asst. Epidemiologist T. H. D. Griffitts. Proceed to Alexandria, La., on special temporary duty. Dec. 3, 1917.

Sanitary Engineer J. K. Hoskins. Directed to supervise malaria work at Macon, Ga., and Montgomery, Ala. Dec. 4, 1917.

Sanitary Engineer R. E. Turbett. Proceed to Little Rock, Ark., on special temporary duty. Dec. 1, 1917.

Sanitary Engineer H. H. Wagenhals. Directed to supervise anti-malaria work, Augusta and Atlanta, Ga. Dec. 4, 1917.

Prof. C. W. Stiles. Proceed to Augusta, Ga., for duty in the prevention of the spread of contagious and infectious diseases. Nov. 27, 1917.

Prof. E. B. Phelps. Proceed to Portsmouth, Va., for conference with local authorities in regard to selection of water supply. Nov. 21, 1917.

Phar. Henry Gahn. Relieved at Quarantine Station, Pensacola, Fla. Proceed to Norfolk, Va., for duty. Nov. 24, 1917.

Sanitary Bacteriologist C. P. Butterfield. Proceed to Manhattan, Kansas, for duty in laboratory studies in connection with the sanitation of extra-cantonment zones. Nov. 26, 1917.

BOOK NOTICES AND REVIEWS.

Essentials of Volumetric Analysis. An introduction to the subject, adapted to the needs of students of pharmaceutical chemistry. Third edition, rewritten and enlarged. By Henry W. Schimpf, Ph.G., M.D. John Wiley and Sons, Inc., publishers, New York. Cloth, 366 pp. Price, $1.60 net.

The exhaustion of the second edition and the revision of the United States Pharmacopoeia have necessitated this third edition of Professor Schimpf's "Essentials of Volumetric Analysis." Many additions have been made, among them methods for assays of mercuric salts, phosphates and hypophosphites by means of standard sulphocyanate solution; processes for assays of chlorates, perborates, chloral, acetone, resorcinol, phenylsulphonates, arsenates, and alkali cacodylate are also included. The appendix contains descriptions of the most frequently employed indicators.

While primarily the book is intended for pharmacy students in the chemical laboratory, it is well adapted as a reference book for pharmacists when making determinations of the strength and purity of chemicals employed in dispensing. As far as the value to students is concerned much more might be said of the book with special favorable comment on the concise and clear presentation of the subject matter.

The book is divided into twenty-two chapters. A typical assay is explained and where possible and practicable other substances, in which the cited method may be employed, are tabulated. There are quite a number of other tables: for determining alcohol percentages from specific gravity; of factors for temperature and barometric corrections, etc.

Many of the changes and additions have been necessitated by the revision of the U. S. Pharmacopoeia; the pharmacopoeial term "mil" is employed instead of Cc.

The favor which the work has gained in its prior issues will doubtless be accorded this revised and enlarged edition. E. G. E.

Everyman's Chemistry. The Chemists' Point of View and His Present Work Told for the Layman by Ellwood Hendrick, Harper & Brothers, New York. Harpers Modern Science Series, 346 pages with an appendix and an index, cloth. Price, $2.00.

The author's preface states that "the second decade of the twentieth century has brought to the average man a general, if vague, realization of the tremendous importance of chemistry and its application in actual life. I think this has never been felt acutely before, and yet it has seemed to me that the same average man is not very well provided with a work that he could read and understand easily and at the same time get a chemical view of things."

In the object of bringing this about, the writer has succeeded. In the interesting discussion of chemical subjects there is some matter that could perhaps have been omitted from this book without detracting from its value, and the chemistry of a number of familiar things might have been advantageously included; thus, for example, no reference is made to baking powder, cream of tartar, citric acid nor gelatin, all of them of importance in the chemistry of the kitchen.

The author brings an attractive literary style to the discussion of chemical subjects, and many of our readers will recall some of the daily articles in the *New York Times* by Mr. Hendrick during the chemical exposition held in New York last September, and which aroused a general interest in the progress and application of chemistry in the industries. While in no sense a treatise on chemistry nor a laboratory guide the book will interest even the chemists and will give the laymen a more correct understanding of chemistry than conveyed by magazine articles and will bring them more in line with the chemist's viewpoint.

E. G. E.

JOURNAL ANNOUNCEMENTS.

Subscriptions: Annual subscriptions in advance, including postage: United States and Mexico, $4.00; Canada, $4.35; foreign countries, $4.50. Single copies, 35 cents. Remittances should be made payable to Treasurer H. M. Whelpley, but mailed to JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, Easton, Pa., or 253 Bourse Building, Philadelphia, Pa. Under the rules of the Post Office the JOURNAL can be regularly mailed only to bona-fide paid subscribers.

Requests for Back and Missing Numbers: Requests for back and missing numbers should be sent to the Editor. Claims will not be allowed if sufficient notice has not been given of change of address, and in no case if received later than sixty days from date of issue. Notice of change of address should give old and new address.

Contributions: The JOURNAL accepts no responsibility for the opinion of its contributors. Contributions should be sent to the Editor; use only one side of the sheet for writing, and double-space the lines. Articles are accepted for publication on condition that they are contributed solely to this JOURNAL; and "all papers presented to the Association and its Branches shall become the property of the Association, with the understanding that they are not to be published in any other publications than those of the Association, except by consent of the Committee on Publication." (By-Laws, Chapter X. Article 11.)

Reprints: Authors may obtain reprints of the Eschenbach Printing Company, Easton, Pa. at the prices attached to the proof sent them, provided the order is received with the returned proof. The prices are also given on this page. Otherwise type is distributed as soon as the JOURNAL is printed.

Advertisements: Communications relating to advertising should be sent to the Editor. Forms close on the first of each month, and copy should be in by the fifteenth of the month preceding date of issue, to receive proof. Date of issue—the fifteenth of the month. Advertising rates sent on request.

Membership: Applications for membership in the American Pharmaceutical Association may be made of any of the officials. The annual payment of five dollars covers the annual dues and subscription to the JOURNAL. Members receive, also, the publications of the Association that are distributed free of charge.

Further information will gladly be furnished by any of the officers of the Association and members.

Cost of Reprints: Reprints will be furnished at the following prices:

SCHEDULE OF RATES FOR REPRINTS, INCLUDING POSTAGE.

No. copies.	4 pp.	8 pp.	12 pp.	16 pp.	Covers.
50....	1.54	3.08	4.62	6.16	1.27
100....	1.76	3.52	5.28	7.04	1.54
150....	1.98	3.96	5.94	7.92	1.82
200....	2.20	4.40	6.60	8.80	2.09

Orders may be sent to Eschenbach Printing Company, Easton, Pa., or JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, Easton, Pa., or 253 Bourse Building, Philadelphia, Pa.

SHOW YOUR INTEREST IN PHARMACY.

For several months past a request has appeared in the JOURNAL that members indicate whether they desire a cut of the insignia of the Association with name "Member" above, as appended, for their Prescription Blanks. A sufficient number of members have signified their interest and therefore these cuts may now be had by addressing the JOURNAL Office as below.

The cost of single type-cut, including postage, is fifteen cents; when two are ordered at the same time, twenty-eight cents. The charge is simply to cover cost and postage.

THE JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

253 BOURSE BUILDING

PHILADELPHIA PENNSYLVANIA